

DRAGON USER



September 1986

The independent Dragon magazine

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Letters

Some Poke corrections — a left over Lee listing — new user groups — pleas for more C64 — missing perians.

People's Chart

Findout which is the software flavour of the month, and what will win the 128 worth of Microdeal software.

News

FREE to Dragon User readers, a limited of Dragon/32 reference cards — Dragon internal hardware bargains — new software for the Trojan light pen.

Communication

What is the Meaning of Life? Just one of those sticky questions to which somebody just might send us an answer, one of these days.

Dragonsoft

Temple of Doom doomed, Boulder Crash rescued man by the eyeballs again, and Roy Casar is glued to The Curse of Carnar.

Counties Quiz

You can test yourself to distraction with this game of 52 separate counties and districts in the British Isles.

Books And Code

Pam Dikaly has found a thousand questions on machine-code and other subjects, so she has rounded up the books where she looks to find the answers.

PUT... EOR

A useful additional command.

Core Wars

In the heart of the Dragon, program hunts program with Red Code, pitting subtlety against stealth.

Machine Code Tutor

Scott Campbell and Jason Orsburn take a step towards the intimidating but not really dangerous subject of Boolean algebra.

Adams Adventures

The first in an occasional series of snippets on the adventures of Scott Adams.

Mini Logo

A specially adapted version of the Logo control language for turtle graphics on the Dragon by Miles Horden.

Dragon Answers

Brian Cadge another page of advice and technical answers from the mailbox.

Arcade Arena

The Dragon takes issue with another lot of arcade games, advice and arguments.

Adventure Trail

The secrets of Juxtaposition unlocked.

Competition

Solutions to last month's riddles, a new prospectus, and this month's winners.

Editorial

Runners get circulating from time to time, like the rumour which said that Dragon User would cease after June (circulated among newsgroups), that so-it-so isn't going to produce any more Dragon software (which has often proved to be true, but not as often as it has been put about), that the Dragon is dead (after Dragon Data closed down in 1984) ... now someone else has started a rumour that our publishers 'don't like' Dragon User, whatever that is supposed to mean.

This concerns us, because it is vague notions like that which cause alarm and dependency. Now listen here: the publishers brought in new staff to keep Dragon User going, a new computer to help with the administration, and brought all the subscriptions under their own control to avoid problems. While the demand exists, so will Dragon User: the demand comes from users. So don't be discouraged by rumours — none of us want them to become self-fulfilling.

On a much jollier note, a well known electronics company has some Dragon 32 reference cards to give away. See page 4 for details.

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How to submit articles

The quality of the material we can publish in Dragon User each month will, to a very great extent, depend on the quality of the documents that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Paragraphs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped, addressed envelope.

Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters Page, *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Lost adventure

CAN you help us with the Dragon adventure? We have received an order from Allos for Colossal Cave with a US postal order unfortunately, no address was included.

So if you live near Thame Road post office and haven't received your cassette, please write or phone 091 225 4874 and identify yourself. Your cassette is waiting.

Malcolm Cowan
Cowan Software
23 Bristol Ave.
Levenshulme
Manchester M9
0619 2947

Caring needed

CAN anyone help with software/hardware/adaptations for use by handicapped children?

S. Boardwood
Weymouth Childrens Home
16 Victoria Rd
Weymouth
Dorset

Banbury club

I WOULD be grateful if you could place in your letters column a call for other users to join a new Dragon club in Banbury and the surrounding area. They should contact me at my address or on (0595) 53303.

J.H. Paster
47 Exington Rd.
Banbury
Oxon OX9 9HU

Back issues

IN ANSWER to the inquiries about back issues, it's slipped your mind that Peaksoft have acquired Dragon User back-

issue stock. Prior to January 1986, the issues still available are: 1984; Feb/Mar/May/Jul/Aug/Oct; 1985: Jan/Feb/Mar. They are priced at £3 each, post included.

We do try to maintain a complete collection of excellent Dragon periodicals, and I hope you won't mind if I acknowledge that we can offer copies of all editions of Dragon Monthly, and printer dumps of Radio Dragon.

Harry Whitehouse
Peaksoft
49 Queens St.
Bicester
Oxfordshire
North NOK 393

Correct Pokes

THE POKES listed for Madness and the Minotaur in the July issue are somehow wrong. Here are the correct ones:

POKE \$772,134 (3200 hex)
POKE \$772,264
POKE \$774,191
POKE \$775,5
Machine code:
\$2044 LDA \$BFF
\$2046 STA <\$05

The poke \$728 sets the number of points that need to be scored to win. I would like to thank Mrs. Pauline Hargrave for pointing out the errors to me.

Simon Hargrave
Crawley Hill Farm
Ulley
Dartley
Glos. GL11 5BN

Hyperun error

THANK YOU for publishing my letters "Pokes galore" and "Screen change" in the Feb and July issues of DU. Thank you also to everyone who has bought my Hyperun program, which is still available at £3.50. However, there were unfortunately some errors printing, and I have come up with shorter versions of it, and £2 instead.

Program A:
\$KIPP:POKE 1264:POKE
127,0:EXEC 48941

Program B:
10 POKK=3200 TO 3100:
READ A:POKE K,M:MOVE
E:EXEC 11:DATA 198,195,146,
134,57,60,1,1,3,126,131,113,
RUN

In "Screen Change", the PRINTG: @ command should be followed by a comma not a fullstop. During the CDS statements, there are some uncrossed semi-colons (';') that should be single-letter 'D's. This should clear up any confusion.

Paul Borpin
18 Moorcroft Road
Fulwood
Sheffield
Notts S20 6SS

Any old OS-9

POSSIBLY it is logical "Back Recording System" of an Dragon 64, as I've decided the product to drag "OS9 Operating System" since you see manual.

Pourriez-vous m'indiquer ou puis-je trouver des données en Grande Bretagne, (à date) sur les "Computers", "Joker Pense" et "Conquest", mais malheureusement ces sociétés ne les possèdent plus.

Merci, agitez, Monsieur, l'expression de mes sentiments distingués.

St Patrick Scudumiac
4 Allée de Capitaine Monce
21100 Venary-Jels-launet
France

Get Serious

I HAVE enjoyed your magazine during the past two years. When are you going to get smart and start catering to the serious user? The Dragon has the capability with OS-9, which is being used in Israel by businessmen, doctors, and engineers. How about a review of "The Banister" board, which expands RAM to 256k without lugging Flex along like a mother-in-law? As a games machine, the Dragon is last year's toy.

Harry C. Taylor F
Chronic Engineer
Wormsagar 30
Hemel
SL600 Alton One
Hemel

WE have a problem with OS-9: nobody in the UK is licensed to market it, so, if anybody is, we have yet to hear about it. We would like more contributions and reviews on professional systems, and would be most interested to hear from anyone who can help on either subject.

Printer connector

OVER the last few months there have been several inquiries both to "Letters Page" and "Dragon Answer" concerning the interfacing of the Tandy TR-10 Printer with the Dragon computer.

The Tandy TR-10 is a thermal Printer which is low priced, compact and is ideal for listings.

As the Tandy TR-10 needs a serial input, a Parallel to serial converter is needed. I have constructed a converter to meet this requirement, and if any one would like details to build this converter, I will supply these at a cost of £5.00.

Alan Johnson
23 Ashmole Road
Abingdon
Oxon OX14 5UH

Puzzle listing

APOLOGIES to Gordon Lee and the gamers for leaving this listing out of the August puzzle page.

- 12 POKE 32000 TO 32020
- 20 GOTO 10
- 30 GOTO 10000 : GOTO 10000
- 100:171
- 10 GOTO 10000:171
- 10 POKE 171 TO A
- 10 GOTO 10000:171:171
- 10 GOTO 10000:171:171
- 10 GOTO 10000:171:171
- 10 GOTO 10000:171:171
- 100:171:171
- 100:171:171
- 100:171:171

Dragon User People's Chart

IF THIS goes on, we'll be re-naming Juxtaposition "P juxtaposition". The Barons of Cell V's popularity just continues to warrant itself. See Mike Gerrard's Adventure Trail this month for some hints, if your nerves are about to crack.

Or you could write to Paul Davidson of 200m Drumming Road, Glanrhyfod, Ballyvaughan, Co. Antrim, N. Ireland BT44 6PP. He hasn't sent an anagram, exactly - he just wrote in the space "I have just finished Juxtaposition, and if anybody wants any help, send me an S&A and I will help them". To Paul. No prizes, though.

A special mention to Keith Farmer, who not only used most of his top three letters, but listed the ones he didn't use, as well. They say (S&A) Barons month's anagram winners T.A. (S&A) of Otterwick, London, who not only used all his letters up, but also listed by what the editor is always saying - "The Dragon word should never not light" "We're creating words. Sometimes."

Found another great program? Discovered new depths in an old favourite? Send us your list of five favourite programs - games, applications, facilities, disk or tape - in order of preference, on the form printed here (or make your own - thousands do).

Moreover, if you can devise a witty or apt anagram from the letters of your own favourite three (you need not use all the letters), you may be the winner of £25-worth of Microdeal software.

Results August 1986

- | | |
|-----------------------|--------------------|
| 1 Juxtaposition | (Wintersoft) |
| 2 Shocktrooper | (Microdeal) |
| 3 Bean Stalker | (Micro Vision) |
| 4 Jet Set Willy | (Software Project) |
| 5 Rommel 3D | (Microdeal) |

Chart Eight

Voting for Chart No. 8 closes at 11pm on Friday 10th September 1986. Entries received after that time will not be eligible for inclusion in that month's voting. The editor's decision is final. Only one entry per individual per month will be allowed.

My top 5: Voting Month 7

Name

1 Address

2

3

4

5

My phrase is:

THE DRAGON COMPUTER SHOW

Returns to Wales

Saturday 4th October Cardiff — Wales Airport 10.00 — 4.00

Another sensational show where you can meet the leading retailers of Dragon Software, hardware and peripherals.

**Adults £1.00
Children & OAPs 50p**

**Ample car parking
Refreshments**

If you would like to demonstrate how you use your Dragon in an interesting or unusual way please contact John Penn.

Further details available from
**John Penn
Bordon (04203) 5970**



Non slip mat

TRADITIONALLY, you want to slip, you step on a mat. It's the last best thing to a banana skin. The Slippap mat has put a stop to all that. Slippap is for the table or the worktop and has the answer to all those slippery problems that can occur in the workshop, lab, office and home! Even, who knows? the sticky carpet, if you use it extensively.

Slippap is made of an inherently tacky material which holds objects placed on it, according to our reports, as if

glued, without leaving any residue on the objects or the table. The tackiness can be restored when flapping by washing the mat in warm soapy water to remove dirt and debris. It can be supplied in various sizes, in thickness of 2 or 3mm, and can be cut to size with ordinary scissors.

Call the supplier, Cobanic Ltd., 32, Lardner Road, Guildford, Surrey GU2 5NW on (0462) 592050 for more information and prices.

Free Dragon Cards

Eicon Electronics have been clearing out their granier's special cupboard and have discovered a hoarded bundle of Nanos Systems Corp. reference cards for the Dragon 32. These handsome, fold-out 18-leaf cards, with 1366 each, contain ready reference information for system commands, BASIC characters, statements and special keyboard keys, instructions for simple graphics and music, BASIC internal codes, memory map, hex listings and special tips, printed in black and white and spot colour on white with a red surround.

One of these cards can be yours, if you are among the first 300 Dragon User subscribers to send a large SAE (A5 size is best), enclosing a DU address label with your subscriber number on it as proof of identity

(the number will be just above your name on your address label), to Dragon Card Offer, Eicon Electronics, 71 Bury New Road, Pinner, Middlesex UB2 5LZ.

Trojan disk

PANCOMMS Ltd. has converted the software supplied with the Trojan lightpen, to run from DragonDOS on disk. The conversion is supplied on disk, with an assembler source file, and costs £3.45 inclusive from the company's High Wycombe address.

On special offer from Pancomms are some copies of the Street and Somerville book inside the Dragon, for £3 (plus overseas). This, they tell us, is the publisher's final possible reduction, so if you want inside the Dragon, don't wait any longer.

Pancomms, 31, Wycombe Lane, Wycombe Green, High Wycombe, Bucks HP12 0HG

Bargains for the brave

Procap Distributors Ltd. have a number of working and non-working Dragon 32 units at knock-out prices.

Said Mr Barrow at Procap: 'We have 30 working Dragon 32s, complete with the power pack, which we are offering for £25 each, and 60 non-working units with minor faults and no power pack, which we are offering for £15 each. We have had to remove the top-cover from all the machines to avoid copyright problems, because they are all out of warranty — there are no guarantees available. Because of this, we really want to sell them to personal sales only, so that they can see what they're getting and have the situation explained to them.'

If someone is really keen and can't get along to us, they can ring up and enquire. We

also have 10,000 square feet of electronic surplus stuff here, if people want an incentive to come by.'

Procap Distributors Ltd. are at the Haybridge Centre, Castle Road, Camden Town, London NW1 (you can stop up from Euston Station on the Northern Line) and the phone number is (01) 267 9911



July shortage

BECAUSE of the dramatic response to Dragon User's subscription offer, some people will find that their subs are starting in August. The reason is simple: we have run out of July issues, so there won't be any available as back issues.

To help out readers who have been building up a collection of DUs, we will photocopy any back issues from July 1985 to the price we normally charge for ads (2, irrespective of length). We are unable to photocopy whole issues.



The main articles in July's issue were:

Carroz: a long machine code game.

Disk Drives: basic advice on choosing a disk drive.

Jaunty Plaster: holiday merrymaking in BASIC.

Extra graphics: for the Teletexter tablet.

Plus adventure: Isak, Dragonsoft (September 47), The Victor Factor, Rommel 3-0, Arcade Arena, Dragon Answers Competition (April winners).

The Machine Code series, unfortunately, did not appear in the July issue.

Please allow plenty of time for delivering photocopies, as we have to fit the copying in around everything else — if there is a rush, this could take several weeks.

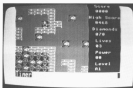
Missing Persons

AFTER a disastrous explosion in the Dragon User address file, we have lost touch with writer Geoff Enbridge and August Progress Chart winner Jason Lee. Please write and let us know where you are.

Too much play!

Program: Boulder Dash
Supplier: Bally
Price: £3.00
Dear Helen Armstrong (Dragon User),
I'm afraid I must write in apology for not getting all my copy in on time last month. But, you have to understand, it's not my fault. You see, one of the games you sent me, namely 'Boulder Dash' by Bally is so good that I haven't been able to stop playing it since I got it! It's really quite unfair of you to send me a game which is so good that I spend so much time playing it I can't get around to reviewing it.

For your information it's a multi-screen game which involves running around collecting gems. Yeah, I know what



you're thinking, 'He's hooked on another Mario/Miller/Clow, but Helen, believe me, it's much more serious than that. Each screen of this takes up about twelve tiny screens, and it scrolls as you move.

The first few screens seem edgily only just fail to drop the boulders out of the way so that I could get to the gems,

making sure nothing fell on my head, get the gems, and go to the exit, but then later on I came across screens with no gems, and realised that the only way to get them was by dropping boulders on the monsters and that each time I hit a monster it turned into more gems.

Then, there was the master

barrier, and the times, oh God, the times! I have blisters on my fingers from using 'Z', 'X', '<', and '>' to move the superb graphic man around the screen. My eyes are sore from staring at the screen until late. My phone bill has stopped below three figures. I've spent so much time at the keyboard. So, apologies once more for not getting the review done. Perhaps you can get something from this letter. Who knows eh?

Yours, Jason Orbaum
PS Are we still on for Friday or are you seeing that jerk 'The Expert'?

Forget it, boys. I'm being taken to La Garroche by a tape cassette wholesaler from Decimfract, Clubogather and buy yourselves a sandwich — fit!



Addicted

Program: The Curse of Carnac
Medium: FLEX disc only
Price: TBA
Supplier: K. Hunter, 48 Greenhill Rd., Epsom, Surrey, Middlesex TW20 2LL.

It is comforting to know that so many what is expected of you, in an adventure, the world you can do is to fall off your chair, although some adventures become so engrossing that your heart rate suffers at moments like these. Something akin to magic separates the good adventures from the bad. Some of them have such an air of mystery and intrigue about them that you hold your breath before telling the final key knowing that it may be the last time you are allowed to do so.

The Curse of Carnac has all of these ingredients and more. There is 27% devoted to dynamic characters, bewildering locations and puzzles for you to explore and exploit. Killing the Bear may have been easy for you as the nightingale is off! Maybe he could have helped you in your quest to save the Kingdom of Balakia against the evil of the Wizard Carnac. That I am afraid is for you alone to find out.

Having spent many hours desperately trying to see as much of this adventure as I could before I reviewed it I must admit to being addicted. My highest score is only 35% and I realise I have spent a lifetime on it already. There are many things which are not obvious at first glance; it plays, as in all adventures, to be meticulously careful in extending your surroundings. Objects which seem to have served their purpose and have been discarded are sadly missed after travelling over mountains and rivers. It pays to know a little about legendary events as some of the more subtlest of mountain places. The program allows a full SAVE/LOAD facility which is useful, especially just before you try something that may or may not seem risky. FLEX commands may also be accessed in mid-game provided that they only occupy the Utility Command Space (SCMD-SCOPY). It is a shame really



that this game is only available from FLEX users, but the sheer size of the program prohibits it from being cassette based.

It is difficult to give a fair appraisal of an adventure game without describing the events which take place in it, but that might spoil the game. Quite

Monster shortage

Program: Temple of Doom
Supplier: Bally
Price: £3.00

He he he! I've got one up on The Expert! He said that Bally had made a game 'similar to Asteroids'. Well, he was referring to Temple of Doom and he was WRONG! The game is nothing like Asteroids. Indeed it's more like Knight Lore!

Right, now that I've had my gloat, onto the game itself. It's a 3-D 'arcade game' which basically involves running round a three dimensional maze collecting food and keys before strength, and thus the very job of life itself, run out.

The graphics are very nice, looking a slight similarity to The Sword and the Sorcerer in terms of iconography (is that a word?). However, it suffers a similar fault to the sword and

simply this is an extremely large and complex program which I found riveting and I don't see why you shouldn't as well.

Roy Coates



the sorcerer — it's boring! The screen jumps whenever something is eaten, or a new room is entered but after a while this becomes almost tedious.

I really have very little else to say. This stinks of a game that's only half way there. It's as if the programmers saying 'This is what I've done so far, but I've got to get rid of that really annoying flicker, and I also have to put the monsters in.'

Well, where are the monsters, Bally?

Bally are amongst my favourite Dragon software houses. They're charming, great fun, and they know when they've put in a duff. I think they know what this stinker was going to be like. If not, sorry lots, but my mate finished up to level four on his first go!

Jason Orbaum



Counties Quiz

J. Hewitt takes a topographical around the UK and Ireland

THE-3 PROGRAM tests you on your knowledge of the map of the United Kingdom and Ireland. The program has four levels (as compass rose or compass rose), a redlined character set, a line scale map of the British Isles covering more than one PMODE 4 screen, computer-style graphic clips, questions that are not repeated during a game, scoring and percentage facilities, and ratings on your expertise (or otherwise).

First type in the program and then RUN. It will ask for the number of questions you wish to be asked. Enter two digits and press ENTER. If you make a mistake you don't only press the backspace after typing both digits. You must type more than 10.

questions in any one game, to allow an appropriate rating.

After a short wait the British Isles will be displayed. If the country is questioned it is the United Kingdom (essentially Scotland), you will see the top four Miles of the map. Similarly the same is true for the southern part of the map. This is because the map takes up five graphic pages and only four can be displayed at a time. The program will chase and fill a county, apart from some of the islands which have boxes round them. You then have to name the county.

Each county is represented by a three-letter code, which is normally the first three letters of the name. See accompanying table for complete list of codes. There is

THREE letters and press 'ENTER', and as before, if you make a mistake you can press backspace when you have entered all three characters. The Delete key is all.

(Only the registered and qualified are eligible for the award of Fellowship)

Your score, and percentage, will be updated. You will be prompted to press a key, and then another county will be shown until all your questions have been asked. Press "Y" for another game.

If all the typing seems too much then an enhanced version, with auto run, can be obtained for £2.50 from Mr J. Harris, 26 Hammonds Croft, Church Meadow, Hixon, Ruffs, ST18 0PD.

Introduction and Objectives

Table of Counties		23.	Dumfries and Galloway	—DAG	46.	Leicesters	—LCT	71.	Northampton	—NOR	
		24.	Durham <th>—DUR</th> <td>47.</td> <td>Leicester<th>—LEI</th><td>72.</td><td>Salisbury<th>—SAL</th></td></td>	—DUR	47.	Leicester <th>—LEI</th> <td>72.</td> <td>Salisbury<th>—SAL</th></td>	—LEI	72.	Salisbury <th>—SAL</th>	—SAL	
1.	Anglo-Saxon <th>—ANG</th> <td>25.</td> <td>Dyfed<th>—DYF</th><td>48.</td><td>Leinster<th>—LEI</th><td>73.</td><td>Shropshire<th>—SHR</th></td></td></td>	—ANG	25.	Dyfed <th>—DYF</th> <td>48.</td> <td>Leinster<th>—LEI</th><td>73.</td><td>Shropshire<th>—SHR</th></td></td>	—DYF	48.	Leinster <th>—LEI</th> <td>73.</td> <td>Shropshire<th>—SHR</th></td>	—LEI	73.	Shropshire <th>—SHR</th>	—SHR
2.	Arden <th>—ARO</th> <td>26.</td> <td>East Sussex<th>—EAS</th><td>49.</td><td>Lincoln<th>—LIN</th><td>74.</td><td>Stafford<th>—STF</th></td></td></td>	—ARO	26.	East Sussex <th>—EAS</th> <td>49.</td> <td>Lincoln<th>—LIN</th><td>74.</td><td>Stafford<th>—STF</th></td></td>	—EAS	49.	Lincoln <th>—LIN</th> <td>74.</td> <td>Stafford<th>—STF</th></td>	—LIN	74.	Stafford <th>—STF</th>	—STF
3.	Bedford <th>—BED</th> <td>27.</td> <td>Essex<th>—ESS</th><td>51.</td><td>London<th>—LDN</th><td>75.</td><td>South Glamorgan<th>—SGL</th></td></td></td>	—BED	27.	Essex <th>—ESS</th> <td>51.</td> <td>London<th>—LDN</th><td>75.</td><td>South Glamorgan<th>—SGL</th></td></td>	—ESS	51.	London <th>—LDN</th> <td>75.</td> <td>South Glamorgan<th>—SGL</th></td>	—LDN	75.	South Glamorgan <th>—SGL</th>	—SGL
4.	Bedfordshire <th>—BED</th> <td>28.</td> <td>Fife<th>—FIF</th><td>52.</td><td>Longford<th>—LOG</th><td>77.</td><td>South Yorkshire<th>—SPY</th></td></td></td>	—BED	28.	Fife <th>—FIF</th> <td>52.</td> <td>Longford<th>—LOG</th><td>77.</td><td>South Yorkshire<th>—SPY</th></td></td>	—FIF	52.	Longford <th>—LOG</th> <td>77.</td> <td>South Yorkshire<th>—SPY</th></td>	—LOG	77.	South Yorkshire <th>—SPY</th>	—SPY
5.	Borders <th>—BOR</th> <td>29.</td> <td>Galway<th>—GAL</th><td>53.</td><td>Louth<th>—LOI</th><td>78.</td><td>Staffordshire<th>—STF</th></td></td></td>	—BOR	29.	Galway <th>—GAL</th> <td>53.</td> <td>Louth<th>—LOI</th><td>78.</td><td>Staffordshire<th>—STF</th></td></td>	—GAL	53.	Louth <th>—LOI</th> <td>78.</td> <td>Staffordshire<th>—STF</th></td>	—LOI	78.	Staffordshire <th>—STF</th>	—STF
6.	Buckingham <th>—BUC</th> <td>30.</td> <td>Glooucester<th>—GLO</th><td>54.</td><td>Louth<th>—LOI</th><td>79.</td><td>Strathclyde<th>—STR</th></td></td></td>	—BUC	30.	Glooucester <th>—GLO</th> <td>54.</td> <td>Louth<th>—LOI</th><td>79.</td><td>Strathclyde<th>—STR</th></td></td>	—GLO	54.	Louth <th>—LOI</th> <td>79.</td> <td>Strathclyde<th>—STR</th></td>	—LOI	79.	Strathclyde <th>—STR</th>	—STR
7.	Cambridge <th>—CAM</th> <td>31.</td> <td>Grampian<th>—GRA</th><td>55.</td><td>Manchester<th>—MAN</th><td>80.</td><td>Suffolk<th>—SUF</th></td></td></td>	—CAM	31.	Grampian <th>—GRA</th> <td>55.</td> <td>Manchester<th>—MAN</th><td>80.</td><td>Suffolk<th>—SUF</th></td></td>	—GRA	55.	Manchester <th>—MAN</th> <td>80.</td> <td>Suffolk<th>—SUF</th></td>	—MAN	80.	Suffolk <th>—SUF</th>	—SUF
8.	Canterbury <th>—CAN</th> <td>32.</td> <td>Gwent<th>—GWE</th><td>56.</td><td>Mayo<th>—MAY</th><td>81.</td><td>Surrey<th>—SUR</th></td></td></td>	—CAN	32.	Gwent <th>—GWE</th> <td>56.</td> <td>Mayo<th>—MAY</th><td>81.</td><td>Surrey<th>—SUR</th></td></td>	—GWE	56.	Mayo <th>—MAY</th> <td>81.</td> <td>Surrey<th>—SUR</th></td>	—MAY	81.	Surrey <th>—SUR</th>	—SUR
9.	Canterbury <th>—CAN</th> <td>33.</td> <td>Gwynedd<th>—GWY</th><td>57.</td><td>Meath<th>—MEA</th><td>82.</td><td>Tayside<th>—TAY</th></td></td></td>	—CAN	33.	Gwynedd <th>—GWY</th> <td>57.</td> <td>Meath<th>—MEA</th><td>82.</td><td>Tayside<th>—TAY</th></td></td>	—GWY	57.	Meath <th>—MEA</th> <td>82.</td> <td>Tayside<th>—TAY</th></td>	—MEA	82.	Tayside <th>—TAY</th>	—TAY
10.	Central <th>—CEN</th> <td>34.</td> <td>Hampshire<th>—HAM</th><td>58.</td><td>Merseyside<th>—MER</th><td>83.</td><td>Tipperary<th>—TIP</th></td></td></td>	—CEN	34.	Hampshire <th>—HAM</th> <td>58.</td> <td>Merseyside<th>—MER</th><td>83.</td><td>Tipperary<th>—TIP</th></td></td>	—HAM	58.	Merseyside <th>—MER</th> <td>83.</td> <td>Tipperary<th>—TIP</th></td>	—MER	83.	Tipperary <th>—TIP</th>	—TIP
11.	Chester <th>—CHE</th> <td>35.</td> <td>Hertford and Worcester<th>—HAW</th><td>59.</td><td>Mid Glamorgan<th>—MGL</th><td>84.</td><td>Timevale Moor<th>—TAM</th></td></td></td>	—CHE	35.	Hertford and Worcester <th>—HAW</th> <td>59.</td> <td>Mid Glamorgan<th>—MGL</th><td>84.</td><td>Timevale Moor<th>—TAM</th></td></td>	—HAW	59.	Mid Glamorgan <th>—MGL</th> <td>84.</td> <td>Timevale Moor<th>—TAM</th></td>	—MGL	84.	Timevale Moor <th>—TAM</th>	—TAM
12.	Cirencester <th>—CIR</th> <td>36.</td> <td>Hertford<th>—HER</th><td>60.</td><td>Monaghan<th>—MON</th><td>85.</td><td>Ulster<th>—ULS</th></td></td></td>	—CIR	36.	Hertford <th>—HER</th> <td>60.</td> <td>Monaghan<th>—MON</th><td>85.</td><td>Ulster<th>—ULS</th></td></td>	—HER	60.	Monaghan <th>—MON</th> <td>85.</td> <td>Ulster<th>—ULS</th></td>	—MON	85.	Ulster <th>—ULS</th>	—ULS
13.	Cleveland <th>—CLE</th> <td>37.</td> <td>Highland<th>—HIG</th><td>61.</td><td>Norfolk<th>—NOR</th><td>86.</td><td>Warrick<th>—WAR</th></td></td></td>	—CLE	37.	Highland <th>—HIG</th> <td>61.</td> <td>Norfolk<th>—NOR</th><td>86.</td><td>Warrick<th>—WAR</th></td></td>	—HIG	61.	Norfolk <th>—NOR</th> <td>86.</td> <td>Warrick<th>—WAR</th></td>	—NOR	86.	Warrick <th>—WAR</th>	—WAR
14.	Clyde <th>—CLY</th> <td>38.</td> <td>Highland<th>—HIG</th><td>62.</td><td>North Yorkshire<th>—NYO</th><td>87.</td><td>Waterford<th>—WAT</th></td></td></td>	—CLY	38.	Highland <th>—HIG</th> <td>62.</td> <td>North Yorkshire<th>—NYO</th><td>87.</td><td>Waterford<th>—WAT</th></td></td>	—HIG	62.	North Yorkshire <th>—NYO</th> <td>87.</td> <td>Waterford<th>—WAT</th></td>	—NYO	87.	Waterford <th>—WAT</th>	—WAT
15.	Cork <th>—COR</th> <td>39.</td> <td>Humberstone<th>—HUM</th><td>63.</td><td>Northampton<th>—NOR</th><td>88.</td><td>West Glamorgan<th>—WGL</th></td></td></td>	—COR	39.	Humberstone <th>—HUM</th> <td>63.</td> <td>Northampton<th>—NOR</th><td>88.</td><td>West Glamorgan<th>—WGL</th></td></td>	—HUM	63.	Northampton <th>—NOR</th> <td>88.</td> <td>West Glamorgan<th>—WGL</th></td>	—NOR	88.	West Glamorgan <th>—WGL</th>	—WGL
16.	Cornwall <th>—COR</th> <td>40.</td> <td>Isle of Man<th>—ICM</th><td>64.</td><td>Northumberland<th>—NUL</th><td>89.</td><td>Westminster<th>—WES</th></td></td></td>	—COR	40.	Isle of Man <th>—ICM</th> <td>64.</td> <td>Northumberland<th>—NUL</th><td>89.</td><td>Westminster<th>—WES</th></td></td>	—ICM	64.	Northumberland <th>—NUL</th> <td>89.</td> <td>Westminster<th>—WES</th></td>	—NUL	89.	Westminster <th>—WES</th>	—WES
17.	Cumbria <th>—CUM</th> <td>41.</td> <td>Isle of Wight<th>—IOW</th><td>65.</td><td>Nottingham<th>—NOT</th><td>90.</td><td>West Midlands<th>—WEM</th></td></td></td>	—CUM	41.	Isle of Wight <th>—IOW</th> <td>65.</td> <td>Nottingham<th>—NOT</th><td>90.</td><td>West Midlands<th>—WEM</th></td></td>	—IOW	65.	Nottingham <th>—NOT</th> <td>90.</td> <td>West Midlands<th>—WEM</th></td>	—NOT	90.	West Midlands <th>—WEM</th>	—WEM
18.	Darby <th>—DER</th> <td>42.</td> <td>Kent<th>—KEN</th><td>66.</td><td>Orkney<th>—ORK</th><td>91.</td><td>West Sussex<th>—WSU</th></td></td></td>	—DER	42.	Kent <th>—KEN</th> <td>66.</td> <td>Orkney<th>—ORK</th><td>91.</td><td>West Sussex<th>—WSU</th></td></td>	—KEN	66.	Orkney <th>—ORK</th> <td>91.</td> <td>West Sussex<th>—WSU</th></td>	—ORK	91.	West Sussex <th>—WSU</th>	—WSU
19.	Devon <th>—DEV</th> <td>43.</td> <td>Kerry<th>—KER</th><td>67.</td><td>Orkney Is.<th>—ORK</th><td>92.</td><td>West Yorkshire<th>—WYO</th></td></td></td>	—DEV	43.	Kerry <th>—KER</th> <td>67.</td> <td>Orkney Is.<th>—ORK</th><td>92.</td><td>West Yorkshire<th>—WYO</th></td></td>	—KER	67.	Orkney Is. <th>—ORK</th> <td>92.</td> <td>West Yorkshire<th>—WYO</th></td>	—ORK	92.	West Yorkshire <th>—WYO</th>	—WYO
20.	Dorset <th>—DOR</th> <td>44.</td> <td>Kildare<th>—KIL</th><td>68.</td><td>Outer Hebrides<th>—OHE</th><td>93.</td><td>Wexford<th>—WEX</th></td></td></td>	—DOR	44.	Kildare <th>—KIL</th> <td>68.</td> <td>Outer Hebrides<th>—OHE</th><td>93.</td><td>Wexford<th>—WEX</th></td></td>	—KIL	68.	Outer Hebrides <th>—OHE</th> <td>93.</td> <td>Wexford<th>—WEX</th></td>	—OHE	93.	Wexford <th>—WEX</th>	—WEX
21.	Dorset <th>—DOR</th> <td>45.</td> <td>Kilkenny<th>—KIL</th><td>69.</td><td>Oxford<th>—OXF</th><td>94.</td><td>Wiltshire<th>—WIC</th></td></td></td>	—DOR	45.	Kilkenny <th>—KIL</th> <td>69.</td> <td>Oxford<th>—OXF</th><td>94.</td><td>Wiltshire<th>—WIC</th></td></td>	—KIL	69.	Oxford <th>—OXF</th> <td>94.</td> <td>Wiltshire<th>—WIC</th></td>	—OXF	94.	Wiltshire <th>—WIC</th>	—WIC
22.	Dublin <th>—DUB</th> <td>46.</td> <td>Lancashire<th>—LAN</th><td>70.</td><td>Power<th>—POW</th><td>95.</td><td>Wiltshire<th>—WIL</th></td></td></td>	—DUB	46.	Lancashire <th>—LAN</th> <td>70.</td> <td>Power<th>—POW</th><td>95.</td><td>Wiltshire<th>—WIL</th></td></td>	—LAN	70.	Power <th>—POW</th> <td>95.</td> <td>Wiltshire<th>—WIL</th></td>	—POW	95.	Wiltshire <th>—WIL</th>	—WIL

Abstract

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Books and Machine Code

Pam D'Arce digs into her backseat to answer some common questions

I **DISCU** that there have been many new books published especially for the Dragon since the demise of Dragon Owner 1988 but as the list that I have put together recently almost doubles the list last published June 1988, I think that it is time that we have an update. The dates are the issue of 'Dragon Owner' containing the reference, followed by the page number. Other information dates only indicate the original reference as far as reprinting goes. Should any readers know of any other books, please let us all in the know!

Regarding availability of the books, I find that library bookshelves still carry a large range of Dragon books. General bookshops are another good source. The *Twinsies* (Gale and Leverett) can often be found on their shelves as well as in good home computer shops — and the *Topspinners* (Coulter Road) also carry the chemical site talk! I also write direct to publishers, having particular problems (such as out of stock) from libraries.

The Dragon 32 Memory Map is still available for \$5 from Wilson Computers.

Services, 10 Jerome Road, Lakeside, Kent
ME20 5UF. I still have some copies of Inside
the Dragon at the publisher's final reduction
price including P&H postmarked.

Administrative Details

The reason for putting together the booklet was that the most common questions that readers write to ask me are: "What machine code book, which Assembler, where can I get a list of Dragon PC/M addresses from, closely followed by which

The machine code book would of course be the beginner's guide that a well-known publisher commissioned me to write, then, understandably abandoned because of Dragon Gate going under. However, it was becoming apparent to me as I was writing the book that I was being asked more and more to write about the 'more exciting' aspects of graphics and sound than for it to be truly a beginner's guide and that with subtle many of the problems. As one of the parents who thanked me for writing the Dragon code, that was

are the graphics here: that is what my work would want to do!

As with anything in life, what suits one person doesn't suit another. It came into 1995's *Assembler on Leventhal* on an IBM machine. I was the first person at the site to write an Assembler program (BASIC being the language at the time) and I found that neither Leventhal nor the manuals were any help in those early stages with the most fundamental aspect of IBM machine code — what to do about, with, why the hardware stack? I did as Leventhal always seemed to do (JL08 3200) and created something like:

The words used in books like *Interface* — we all suffer from those idiosyncrasies that put a barrier between us and perceiving. The focus is spent poring over those early (and later) Lavalent chapters — I thought that I would meet him — only to discover that 90% of it is not needed, and much of that becomes much more understandable when one has been coding for a little while. Therefore one can go back and realise the cause and effect and correct ways of doing things.

because of the architecture of the machine and such like.

As for the books...not possessing copies of every machine-code book, I cannot give complete opinions. My opinions are also tempered by my programming background. David Barnes's *6809 Machine Code Programming* received a favourable review in the November 1984 issue. I have never seen it about and, not particularly needing a copy apart from curiosity, have not gone out of my way to get hold of it. Being published later than most machine code books, it would seem a useful prospect.

Fewer mistakes

The books that I work from are inside the Dragon and the *Lowenthal* and *Zaks* books. Inside the Dragon was a revelation to me as so many books contain so many errors. It is fairly easy to spot an error in a BASIC program, but how can a beginner possibly spot and put right machine code errors? Even mainly BASIC books with bits and pieces of machine code (including *Sunshine* books!) are notorious for this. I haven't tried all the machine code in inside the Dragon, but the only mistake I have come across in this well-thumbed book is on page 215 where it mentions the cassette gap flag byte being \$05 for 'not-out-of-stream' whereas it is actually \$00 (pointed out on page 248). It was co-written by a Dragon Data employee and contains much useful Dragon hardware and ROM information.

The *Lowenthal/6809 Assembly Language Programming* and *Zaks/Programming the 6809* are so helpful to the Dragon programmer as such. I find the strength of the *Lowenthal* is the detailed examples it gives when describing each instruction and, even more valuable for patching programs when testing, is the full, numerically sequenced postbyte table in the Appendices. I reckon that that table alone has paid back its £14 cost many times over for me in the past! The *Zaks* is the more recent of the two books and I feel that it contains much more easily assimilated programming examples for beginners than the *Lowenthal* and with a page per instruction, the instruction code table is more easily displayed at the head of pages, it is a much easier preparation for the quick check when coding!

Do skip bits of a book and go back over it later if you are struggling — our learning patterns differ so much. So many books seem to be so technical at the beginning that we can get bogged down and give up.

The right tools

I think it essential that would-be machine coders purchase the tools for the job. They are very reasonably priced these days and can only help you get to grips with machine code more quickly. I consider the tools to be a disassembler, an assembler and a monitor.

I believe that a lot can be learnt from others. There is no one way of programming. By possessing a *DISASSEMBLER*,

chunks of machine code can be disassembled (turned into 'look-a-like' source code) and examined even though the source code is not given in articles, etc.)

The *ASSEMBLER* allows you to write source-code and assembles (= translates) it to machine code for you.

MONITOR helps when you cannot test a machine-code program. With it you can TRON (trace on). A monitor will help you trace through the path that your machine code is (no doubt, unpredictably!) taking.

There are still two commonly available sets of tools available on the Dragon — *DAGMON/DEMOM* (from Compuserve) and *ALLDREAM* (from Discover). I am a dedicated *DEMOM* user and have never seen *DAGMON/DEMOM* in use, yet alone tried it so cannot comment upon the differences or use etc. Inside the Dragon uses *ONEAid* for its examples whereas most other books use the earlier available *DAGM*. Both are available on cartridge. I know that *DEMOM* is available on disk when the cartridge port is needed for a disk controller. I do not know about *DAGM*. *DAGMON/DEMOM* was reviewed briefly in the September 1983 issue. *ALLDREAM* more thoroughly in September 1985. Looking over my index, there are further references to *DEMOM* in the July 1984, October 1984 and June 1985 issues.

Perhaps now you can see why asking for recommendation of a machine code book or an Assembler presents such a difficult problem.



DRAGON BOOKS

List compiled
5th July 1985



Title

25 Programs for the DragonII
28 Programs for the DragonII
6809 Assembly Language Programming
6809 Machine Code Programming
Advanced Graphics/Graphics for the DragonII
All about FORN
History of the Dragon
Arcade Games in BASIC (Tandy/Dragon)
Artificial Intelligence on the Dragon
BASIC for your Dragon/II: code easy
beginner's Guide to FORN (The
Best of Fun software for your Dragon
Books Guide to the DragonII
Brain Teasers for the DragonII
Color Computer Graphics
Color Computer Graphics (The

Publisher

Garbus
Fun
Discover Publications
Orlando
Sunshine
Mid Software
Sigma (Italy)
Sexton
Sunshine
Arrow Books
Inter-Lane Publishers
Centurion
Orlando
Frontier Pub. House
Radio Shack/Canada
Arnold

Author

Hartwell
Gross/Hall
Lowenthal
Barnes
Brian Hall
Horton
James
King/Edell
Brian Hall
Hartwell
James
Stinson
Lutenski
Jordan
Lynn

Review(s) Other info

Journal of Computer
July 84 (84) August
Sep 84 (79)
Nov 84 (79)
July 84 (72) Sep 85 (80) Oct 85
Sep 84 (79) Oct 84 (79)
Nov 85 (77)
Jan 85 (74)
Feb 85 (73)
Nov 85 (77) Jan 86
July 84 (84) Oct 84
From Tandy store
Journal of Computer

Creating Adventure Games for your Dragon	Interface Publications	Bedford	Jan 85 (41)	
Dr. Watson Begins a Search for the Drag.	Hayward			May 85 (28) advert
Dragon Companion (17th)	unknown	Jersey		June85 (31) advert
Dragon Encyclopedia	V&R Comp.Services	Wakefield		June85 (31) advert
Dragon Machine Code	Shima	James-Cress	Dec 84 (21)	Oct 84 (21) advert
Dragon Machine Code/Translate Beginners	Melbourne House	Hayden J V		Mar 84 (84) errors in
Dragon Magic	Poulton	Widnes	June84 (34)	
Dragon Programmer (17th)	Brenada	See		June84 (31) advert
Dragon Program	Duckworth	Haywards	Feb 85 (37)	
Dragon Trainer (17th)	Sunshine	Lloyd	June84 (39)	Nov85 (34) error in
Dragon11 Basic of Basic (17th)	Brenada	James-C		June85 (31) advert
Dragon12 Basic Reader	Sunshine	Drain G&S		June85 (31) advert
Dragon12 Machine Code for Engineers	Computat	James		Oct 85 (34) advert
Dragon12 Memory Map (98 pages)kill locs..	Wilson Comp.Servic	Elgin		email from Milton
Dragon12 Programmer's Reference Book	Melbourne House	Hayden J V	June84 (41)	
Dragon12 Reference Manual: (17th)	Elgin Electronics			July85 (36)news item
Dragon12 and how to make the most of it	Brenada	Stclair		June84 (31) advert
Dragon1200 - a Programmer's Guide	Bromeyer Software	Larry	Mar 84 (19)	email, Bromeyer's
Dynamic Games for the Dragon12	Interface Publications	Young-C		May 85 (28) advert
Easy Programming for the Dragon12	Shima	Stewart-Jane		June85 (31) advert
Enter the Dragon	Melbourne House	Carter		Jan 85 (23) advert
Exploring Adventures on the Dragon	Duckworth	Bervard	May 84 (29)	Aug 84 (34) advert
FORTRAN for Macros	Womers	Gallier	Mar 85 (37)	
Forward 188 (1088)	Viking	Hammond	Mar 85 (37)	
Further Programming for the Dragon12	Elgin	Stewart-Jane		June84 (31) advert
Gateway to Computing with the Dragon12	Shima	Stewart		Dec 84 (28) advert
Getting the most from your Dragon12	Penguin	Bancroft	June84 (37)	Jan 84 (28) advert
Glaid Book of Games for your Dragon	Poulton	Wentwell-C	Dec 84 (21)	
Being Bored with Editor BASIC	Radio Shack/Landy			May 84 (28)news in bit
Hot Program to Feed your Dragon	Gigas Wales	James		Dec 84 (28) Aug 84 (85)
Inside the Dragon	Malton media	Hammonds	July84 (25)	Mar 84 (84) Passmore
Intro.to BASIC programming (17th)	Dragon Data	Widnes		April, Compuserve-
Introducing Dragon Machine Code	Brenada	Stclair	Sept84 (38)	
Introducing Pascal	Brenada	Allen	Feb 85 (37)	
Introduction Course 808 for Dragon12/84	Canova			May 84 (28)news item
Introduction to Dragon12/84 (1st)	Dragon Data	Hayer		with Dragon12/84 cart
Know your Dragon	Day Pub. Company	Moore		July84 (84) recommend
Languages of the Dragon (17th)	Gigas Wiley	James		Dec 85 (35) advert
Learning to use the Dragon12	Gower	Knapp	June84 (37)	
Learning to use the Dragon12 computer	unknown	Widnes		June85 (31) advert
Load and Go with your Dragon	Flippo Associates	Flippo/Joane		May 85 (31) advert
MSBASIC Cookbook (17th)	unknown	Barnes		June84 (31) advert
MSBASIC Microprocessor Summary Card	Motorola			email, Compuserve
Make the most of your Dragon12	Interface Publications	Bedford		May 85 (28) advert
Pocket Handbook for the Dragon (8)	Duckworth	Bervard-Wiley	Feb 85 (37)	
Power of the Dragon (17th)	Microsource	Sharp-Harris		May 85 (31) advert
Programming the 4800	Elgin	John-Lewis	Sept84 (39)	
Programming the Dragon for Game/Drugs	McGraw-Hill	Phillips		Oct 85 (34) advert
Programming the Dragon12	Womers	Gafferty	Jan 85 (41)	Mar 84 (53) advert
Reference Card for the Dragon12	New Systems Corp.			Sept85 (31) advert
TR8-BB Color Computer Technical Ref.Man.	Radio Shack/Landy	Chadwick		from local shops
The Penguin Book of Personal Computing	Penguin	Griffin	Mar 85 (37)	
Training your Dragon12/84	Freddie Hall	Collier-Mar	Nov 84 (29)	
Using Pippin Drive/Dragon (17th)808	Canova/Presser	Johnson-Ravi		with 2nd/8485 cart1
Working Dragon12 (17th)	Gowdane	Lawrence	June84 (40)	May 84 (84) advert
(17 books)				

PUT ... EOR

C.C.A. Smith adds an exclusive QFT to PLT and shows everyone up.

IT HAS often struck me as strange and frustrating that although the parameters for the PUT command include AND and OR, they do not include the theological function *ex OR* (exclusive OR).

The program shown here corrects that deficiency. There is also a short demonstration program which shows the effect of overlapping columns using FOR.

When a portion of a graphics screen is saved in an array using GET with the `-C` option, there are a number of ways in which the PUT command may be used to display it. The `PUT` parameter displays it incorrectly the same colour as the original, obfuscating whatever it covers. `PRSET` reverses the array colours before displaying; `PGD` does not display the array at all — it reverses the colours in the screen area signified. With the two remaining options — `AND` and `OR` — the array is

each point displayed is determined by a comparison of the corresponding points in the array and the existing screen area. A table showing array colour screen colour and resulting colour for AMD and CM is given in Figures 1 and 2.

So far so good. But take the following situation: a program has been written in which an X-shaped cursor moves across a 40-column-by-60-screen. The X is saved in an array stored in memory, using GSET with the G option. Which PUT parameter to use? Obviously not FEET, which would always show the cross against a green background. In fact the OR option is normally used, but it does have the drawback that the cross disappears when placed on a red background.

The solution is to use EOP. Each point of the cross now shows up clearly against whichever colour it is placed over. It works.

equally well with two-colour graphics. Figure 2 shows the effect of lighting all three colour combinations.

The BASIC program below loads the machine code routine either to the available BASIC RAM and writes a JUMP to the start address in the RAM stack (initially 0). After running the program, the new PUT option will remain available until there is a cold restart — or the machine is turned off — or until the machine code is overwritten. In the last case, which should only happen if a new mc routine is loaded, make sure either to restart the EOI set-up program, or to switch off the utility code **POINT.ABCT**.

For the sake of simplicity, I have used "X" for exclusive as the new parameter, but almost any character or BASIC keyword could be used if the third byte of the data is altered in the relevant value.

**Figure 1 AND
array colour**

4	3	2	1	
4	3	2	1	4
3	3	1	1	3
2	1	2	1	2
1	1	1	1	1

Figure 2 CH
immune response

	4	3	2	1	
4	6	9	8	7	4
3	5	7	6	5	3
2	4	5	2	2	2
1	3	2	1	1	1

Figure 3 ECG
arrhythmias

4	3	2	1		
1	2	3	4	4	seems okay
2	1	4	3	3	
3	4	1	2	2	
4	3	2	1	1	

[illegible]

```

00          PUT ..EOP *****
*****
24700      FREQ      CC, 1
          TST       EOP
          BEQ       NEG0
          LDC       2, 0
          CMPE      CMMPE
          BEQ       NEG0+2
MEM0      FLS      CC, 0, PC
          LEQW      0, 0
          BRB       [L0, 1]
          JSR       BRP
L0L1      JSR       BR700
          JSR       BR900
          JSR       BR207
          LDQ       0, 0
          LEQW      -0, 0
          LDQW      0, 0
          STQ       0, 0
          LEQW      2, 0
          LDB       0, 0
          ANDL      0
          STB       BCF
          LDB       BCF
          BEQ       L0L2
          JMP       BR400
L0L2      CLB       BCF
          JSR       BCF
          BRB       L0L3
          JMP       BR500
L0L3      CDB       BCF
          JSR       BR900
          CMPE      CMMPE
          BEQ       EOP
          JHP       BR000
EOP       LEQW      PUTIT, PC
          LDQ       EOPCNC
          JHP       BR000
*****
00
POWER     EOWA      0, 0
          STA       0, 0
          JHP       BR000
*****

```

Core Wars

Die Dwarfs pits program against program with a game that strains the mind more than the hand.

USUALLY programs have fairly peaceful jobs: just running Spreadsheets, Space Invaders and the like, but with Core Wars programs they have to fight for the right to run!

I got the idea for programming Core Wars from *Scientific American*, in which A.K. Dewdney explains the subject. Core Wars uses a language called Red Code, which is similar to Assembly, but it has only nine commands.

The purpose of Red Code is to corrupt your enemy's program by bombing it with executable statements and thus forcing it to crash. The programs are held in the Core, which can be defined as a group of memory locations set up in a circle where there is no beginning and no end. Our specific Core will have 192 locations in which the programs can work. Because of this, the programs will have to be short and efficient as well as deadly.

Before I describe how to load and run the programs, here's a rundown of all the commands. Note that A and B are parameters and not variables. Actually, there are no variables in Red Code.

- 1) **DAT A** - This statement is used to hold data. As it is not executable, it can also be used to stop a program.
- 2) **MOV A B** - Move the content of address A to address B. This command will move the content of A even if it is a command.
- 3) **ADD A B** - Add the contents of address A to address B. A is unchanged.
- 4) **SUB A B** - Subtract contents of A from B. A is unchanged.
- 5) **JMP A** - Transfer control to address A.
- 6) **JMP A B** - Transfer control to address A if contents of B are 0 (e.g., in a DAT).
- 7) **JMG A B** - Transfer control to address A if contents of B are bigger than 0.
- 8) **DEC A B** - Decrease content of address B if it is 0 — jump to address A.
- 9) **CMP A B** - Compare contents of A and B. If unequal, skip the next instruction.

Note: A and B are only integers from -126 to +127. There are three addressing modes in Red Code:

Immediate: A '#' symbolizes this mode. It means that the number after it will be treated as an integer. **DAT #5** will store 5 where the DAT appears.

Direct: Just as it says. When reaching a number in this mode the computer will go directly to the location specified. **JMP 5** will jump 5 addresses forward in the Core.

Indirect: A '@' indicates this mode. I'll explain this with an example. Normally the command **MOV A B** will take whatever is in B locations after A, and put it in the register, while **MOV @B B** will go to relative address B and see what's in there. It should point to

another location, say 8. Then the program will move to relative location 8, see what's in there and only then, move to 7. A good example for this will be the **DWARF** program discussed later on.

The editor of this program is a pretty simple one (somewhat like the Spectrum). The top part of the screen (13 top lines) should show you lines 1 — 14 in the program 0, which are now empty. Right now you can press a few keys that will instantly perform the task they stand for. They are:

- [Up arrow]: Move up through the program.
- [Down arrow]: Move down through the program.
- [H]: Get you to the help page.
- [C]: Erases the whole core (Good after messy battles).
- [S]: Saves the whole core situation.
- [L]: Loads core situation.
- [M]: Saves program currently in memory.
- [R]: Loads a program to the memory.
- [O]: Compiles a test program to the Core.
- [E]: Executes the two programs in the memory.
- [P]: Prints the test of a program to the printer.
- [X]: Lets you look at the Core without running it.

[1, 2, 3, ... 14]: Lets you edit lines. Type the number and then enter. The line will appear at the bottom of the screen where you can edit it.

To make it easy to try different programs with each other you can load six programs in the test memory simultaneously. You can do through them using the [R] key. Any addresses are done relative to the program (saving, loading, compiling etc.).

There are a few steps to running programs together:

- 1: Think of a few programs (in this case, two). We'll use two programs by Dewdney: **IMP** and **DWARF**. **IMP** is a one line, primitive program that runs through the memory, destroying everything in its path.
- MOV 0 1

It moves from relative location 0 (the command itself) to relative 1, and moves to the next location — which is none other than MOV 0 1. This way the whole memory is slowly filled with MOV 0 1, and any program without proper protection is erased.

And Dwarf. This program plays in one place and commands the core with changing data, every eight locations. It never hits itself but is unlikely to hit **IMP**. In this battle, **IMP** usually wins. Here's the program.

```
DAT -1      *pointer to first board
ADD -8 -1   *add 8 to pointer
```

```
MOV -2 0-2  *move DAT to pointer loc.
JMP -2      *continue the loop
```

2: Clear the memory. Type 'N'. An appropriate message will appear if done correctly.

3: Put the programs in the Core. Type in **IMP** (Press [C] + Enter). Type **MOV 0 1** (Enter).

Press [C]. The computer will ask you where to put the program. We'll put it at location 70. After a while you'll return to program.

Type in Dwarf as explained with **IMP** and compile it to location 20.

4: The two programs should be in the memory now. You can see them with the X option in test 1, i.e. right joystick up.

5: Turn [C]. Before running the test you must answer a few questions:

How many players? (2-255) — 2 (Imp and Dwarf).
Name for player 1: — Imp.
Location: -70 depends on where you put **IMP**.
Starts at line: 1 (First line in the **IMP**).
Name for player 2: Dwarf.
Location: 20.

Start line for Dwarf: 2 (You'll notice Dwarf starts with a DAT. Since we didn't want it to die before it's also born, we must start it at the DEC 0 0 line).

Moves: (0-40000) — 2500 (If a player loses, the program will tell you, but just in case there's a tie, without any limit, the program can go on for ever).
Speed: (0-255) — 150 (A short delay is made so slowly see how our program dies away).

Display: (Y/N): If you want to see exactly what goes on in the Core, type 'Y' and if you want to see a full evolution, type 'N' (displaying data takes time on Hiles).
WAIT: (Y) You should be seeing the core now. Press any key and the battle commences!

6: Wait. At the end of **EXECUTION** line (see help) your Dragon will tell you just who won, or if there's a tie.

Sample programs

The display in Core Wars takes a very important role in understanding the programs. The Mainframe version of Core Wars just prints out the outcome of the battle, but having to see the visual/historical time action. At first, the display might not seem too understandable but a lot of data has to be seen at once. Generating 192 locations on one screen is impossible, but it is possible indeed. Figure 1 shows how it's done. This shows three programs running at the same time — **IMP**, **Dwarf** & **Comet**. The little inverse numbers show

MOV4:0-5
SUB #11-8
MOV5:0-7
JMP 7
DAT5
JMP @1
JMP0
It works by setting a "packet" and checking if

it changes. The instant the packet changes, SMP is doomed! Capsure will cut SMP's head off and keep it in its last contended (JMP 0).

Most of the programs above have one task, but since many programs can be run at the same time upto 255 but the core size is only 192 so my best suggestion for an

interesting battle is four tasks (programs running at once).

So that's it on my behalf. Remember to plan ahead every move in your programs before sending them forth into reaches of the Core or the results will be disastrous...after all, who wants to be destroyed by a faulty JMP?

Listing 1 — BASIC

```

0 IF G0=1 THEN 120
10 CLEAR200,20000:CLS:AB=STR$(G0,"0")
15 PRINT"PROGRAM:" CORE WARS SIMULATI
ON" PRINTAB
20 PRINT"PROGRAM" PROGRAMMED BY A 204 CLS
300:PRINT"PROGRAM" CORE WARS IDEA = A.W.
DEMENT
30 FOR I=1 TO 1000:NEXT
40 IF PEEK(127777) < 0: THEN CLONOT"CORE W
ARS
50 PCLVAR0
60 CLS:DIR L100,L100,AB00,AB15,65),C15
3,514(10):FOR I=0 TO 0:READS0(1):NEXT
70 G0=1
80 L0=1
90 L1=1
100 PR=0
110 AB=""
120 / main loop *****
*****
130 / PRNA CURRENT LINE STATUS
140 PRINTAB00,STR$(G1," ") PRINTAB,"
":FOR L=0 TO L0:3)PRINT(AB(PR,L):NEX
T:PRINTSTR$(G0,"-"):
150 G0=""
160 PRINTAB00," PROGRAM" PR:
170 AB=INKEY$:IF AB="" THEN 170 ELSE AB=
AB00
180 IF AB=CHR$(13) OR AB=CHR$(0) THEN B
=LEFT$(AB,LEN(AB)-1)
190 IF AB=CHR$(0) AND LEN(AB)>0 THEN B=
LEFT$(B4,LEN(B4)-1)
200 IF AB="C" THEN 350 ELSE IF AB="S" TH
EN 330 ELSE IF AB="L" THEN 1100 ELSE IF
AB="X" THEN 1120 ELSE IF AB="R" THEN 115
0 ELSE IF AB="U" THEN 1200
210 IF AB="a" THEN 200 ELSE IF AB="i" TH
EN 600 ELSE IF AB="e" THEN 240 ELSE IF A
B="h" THEN 300 ELSE IF AB="P" THEN 1000
220 IF AB=CHR$(84) AND L0=1 THEN L0=L0-1
GOTO 140 ELSE IF AB=CHR$(8) AND L0=1
THEN L0=L0-1GOTO 140
230 IF AB=CHR$(13) THEN SOUND 200,1:PRI
NTAB00,B4:GOTO 170
240 A=VAL(B4):IF A=04 THEN A=04 ELSE IF
A=1 THEN A=1
250 NOW PRINT THE LINE AND EDIT
260 L1=0:FOR A1
270 PRINTAB00,L1:CH0(10):" "
280 AB=INKEY$:IF AB="" THEN 280
290 IF AB=CHR$(0) AND LEN(L1)>0 THEN L
1=LEFT$(L1,LEN(L1)-1):GOTO270
300 IF AB=CHR$(13) THEN B4(PR,A)=L1+" "
GOTO 140
310 IF AB=CHR$(0) AND LEN(L1)=0 THEN 37
0
320 IF ASC(AB)>32 THEN 320
330 L1=L1+AB
340 GOTO 270
350 CLS:PRINT"COMPILE" INPUT"MEMORY LOC
TION TO START AT..."L0,PL=2000:L4=100:PL
360 IF L0 OR L1=1 THEN 370
370 FOR L=1 TO 64
400 C0=0:G0=0
410 "FIRST TIME UP THE LINE IN TO
THREE PIECES
420 L4=0:FOR L=1
430 IF L=0" OR L=64 " THEN NEXTL1:GOT
O 630
440 A=0
450 FOR C=1 TO LEN(L4)
460 A=0:000(L4,C,1):IF A=0 " THEN A=000
100(A)=C:0000 1,1
470 NEXTC:L0=L+LEFT$(L4,C1)-1:G0=0:000
(L4,C1)+1,C1)-1:G0=0:000(A)=RIGHT$(L4,
LEN(L4)-C1)
480 "AFTER THAT, DEFINE ALL POKES " IN
THIS PASSION:
490
500 / COMMAND PEEK
510 FOR I=0 TO 0:3)G0=0:G0=0:1)THEN NEXT
I:PRINT"COMMAND " "G0" " NOT UNDERSTOOD"
+CHR$(13)+STR$(G0,32)+"***** LINE
" L1:PRINT"INPUT PRESS ANY KEY..." :GOTO300
10:GOTO 140
520 C0=1
530 FOR L=LEFT$(G0,1):G0=LEFT$(G0,1)
540 IF C0="R" THEN G0=0:G0=RIGHT$(G0,
LEN(G0)-1)
550 IF C0="B" THEN G0=0:G0=RIGHT$(G0,
LEN(G0)-1)
560 IF C0="X" THEN G0=C0+0:G0=RIGHT$(
G0,LEN(G0)-1)
570 IF C0="S" THEN G0=C0+0:G0=RIGHT$(
G0,LEN(G0)-1)
580 "AND POKES:0
590 G0=VAL(G0):G0=VAL(G0):IF G0=0 THEN
G0=255+G0
600 IF G0=0 THEN G0=255+G0
610 POKES PL,C0:POKES PL+1,G0:POKES PL+3,G0
POKES PL+5,G0:PL=PL+4:POKES PL,G0:PL=37
62 THEN PRINT"leave note: YOUR PROGRAM
HAS EXCEEDED LOCATION
380,AND IS PROCEED=
END TO 0."PL=2000

```


[illegible]

Get Logical

Geoff Campbell and Jason Orbaum look at Boolean theory...

1988? This is the month in which we go over AND, OR, EOR, and NOT.

So to Boolean logic, analog which squares many but for absolutely no reason at all, as it is actually extremely easy. We will cover the theory this month, and follow it up with some practical applications next time. For those of you familiar with the GET and PUT commands in Microsoft Extended BASIC on the Dragon (though why the heck you should be programming in BASIC anymore is totally beyond us) the commands AND, OR, EOR, and NOT should need very little explanation. However, for those pure of mind and body there follows an explanation of AND, OR, NOT and the ever so mysterious EOR.

The instructions are all BITWISE, which means that, although they work on bytes, they're all purely dependent on individual bits within the two original bytes. For example, we might as well start with the NOT instruction, which is actually one of the simplest one-operant. If we have a value A, NOT A is the *arithmetic complement* — see last month's article. This is expressed as $\sim A$.

If we want to express the value C as the logical AND of two values A and B, we write $C = A \wedge B$ or $C = A \& B$, which is equivalent to the arithmetic multiply, for reasons that will hopefully become clear. To work the value out, any bit in C is set (=1) if both bits in A and B are set, else they are reset (=0). If we let A = 01101011, and let B = 10011101,

then $C = 01101011 \& 10011101$, or
 01101011
 10011101

 $C = 00010001$

Moving lightly on, the OR instruction is very similar. We would write $C = A \vee B$, which is, obviously, equivalent to the arithmetic add instruction (this, along with the previous allusion to arithmetic, will be explained a fair time later). The OR instruction sets a bit in the result either one or the other. In A and B is set, else resets the bit. Hence, using the values as before, $C = A \vee B$ becomes:

01101011
 10011101

 $C = 01111111$

This connection with arithmetic is fairly interesting, if a little practical use. If we take any value other than zero as being true (0 set) and zero as false (0 reset), we can move along the two operands and, taking each pair of bits in turn, perform the relevant arithmetic operation to get the same result. The tables below illustrate this, as well as giving all combinations of bits.

A	B	A & B	A	B	A ∨ B
0	0	0	0	0	0
0	1	0	0	1	1
1	0	0	1	0	1
1	1	1	1	1	1

Now, all got that? Good. We can now move on to the more interesting instruction, Exclusive OR, EOR for short. This has no symbol that we can remember, so forget the arithmetic connection for now. With EOR, a bit in the result is set if one or the other, but not both, of the source bits is set. It can be expressed in terms of the preceding three instructions, as:

$C = \sim(A \& B) \& \sim(A \vee B)$
 Doing back to the previous figures, we get:

01101011
 10011101

 01101110

Simple eh?

We will cover practical applications, which are legion, at a later date. And that's about it for this month, save to tell you that next month's is a VERY important episode in our existing series!

Next month we will be publishing a comprehensive table of all the commands necessary for simple machine coding on the Dragon, along with a revision description of each command. That marks the end of this first set of Machine code articles but after a one month break we'll be back with a second set to explain all the really useful stuff: the sound, graphics, interrupts (maybe), and data processing.

Scott Adams Adventures

... and Jason Orbaum starts revisiting the Adams family of adventures.

ARMED with a nearly full set of Scott Adams adventures, we set off to crack them all, and failed miserably! However, at this point the letterbox clattered and into the mat fell the hintbook. ... In a state of jubilent shock as returned to the doormat, opened it, and decided that it was cheating so we couldn't use it. So, what this article intends to do is help you with the earlier problems in these adventures (in the cases we have solved), and provide you with a short review.

Before we start this review here are some general hints and trends in Scott's adventuring ...

1) All Scott's games are fairly easy to map once you realise that some clues from some locations actually take you nowhere!

2) Scott has a wicked sense of humour and loves pun and word play.

3) HELP usually means a simple hint often.

4) Not every object always has a use but those are very few and far between.

The code we will be using to print clues to the adventures is simple. Simply read alternate letters and ignore the spaces! The reason they are coded like this prevents you from reading a clue you don't want to read.

So then, to the first of the adventures:

ADVENTURELAND.

The story: you find yourself in a mystical land of Dragons and Magic, and the aim is simply to collect thirteen treasures and store them away.

The adventure: this is a very good adventure to play as a first, because although it is not as easy as Pirate Adventure it lays down a set of ground/coloured conventions which tend to hold true not only across the entire range of Scott Adams adventures but across adventuring as a whole. Its problems are now picked but it must be remembered these are the originals. It plays very well, and tends to open up as you get the correct rate. Don't worry if you can't solve the first problems you come across straight away, often, the objects you need come later on in the adventure. In the progress of your adventure you should come across a sleeping dragon, a rather nervous bat, some killer bees, a goblin, and nice bit of pyrotechnics. A good game, not too hard, and an ideal introduction to the series. Don't use the hints unless you absolutely have to

as you'll find it spoils your sense of satisfaction when you do finish the adventure.

The hints:

- **Can't catch the fish?**

NDHWEDRMTYTHUJNOOPBACSTF
 FLHGHQUPKXACTREOR

- **Mark in the map?**

MEAGSGGDCGAGAGHPRHATOTDUL
 ESS

- **Cannot get past locked up well?**

DNLEGBHHTYTHUJPOWSESTHPELF
 ATDNEVH

- **Missing a crown?**

ORCHTEHRESCHEEEDROGOSM

- **Cannot get on from quicksand?**

TEHREHAGROCHTHSLUMAFQCB

- **Cannot get treasure from boat?**

DQAGHILBARYDYNMGQPOFQRL
 HVT

- **Cannot get mirror from bear?**

SACREHICAM

- **Cannot walk through?**

BAKEWQOUBADEESOTUOAGGRAD
 QUCAM

- **Need last treasure?**

IFUWESLDEWMP

Mini Logo

Mike Hosken presents a compact Dragon version of 'turtle graphics'.

LOGO can mean all sorts of different things to different people. It may provide the means of constructing a 'real turtle' as it goes over to accurately across the floor of the primary school, drawing shapes at the behest of its infant operators.

Or it may be used to provide a model of recursion in advanced courses in computer science.

Dragon owners have long been able to purchase full-bodied versions of the language. And there can be no substitute for the real thing.

But for those whose chief interest lies in turtle graphics on the screen there is no reason when it comes to using Dragon Basic its previous required effect. The inability to combine standard Dragon characters with graphics is a disadvantage, of course, requiring that all letters and numbers should be defined as graphics characters. (So lines 100 to 500 are taken up with a full set plus square brackets).

Now it may well be that you already have such a set of graphics symbols. If that is the case then the sensible thing to do here is to load your set from some other program, delete the unwanted sections, renumber if necessary, and then type in the remainder of the MiniLogo lines. (Conversely, a full set is provided here even though some cannot be recognised by the command structure, in case you find a use for a coherent set elsewhere in your programming.)

But to begin at the beginning...

Users who have not come across turtle graphics (BASICs?) need some guidance, provided here in the opening lines, up to 130, and illustrated as a print-out in Figure 1.

The whole initialisation section, 130 to 500 plus the turtle class B-line subroutine, takes a measurable time to execute. But by filling the screen first (without the use of any

variables) there is no obvious delay at all and yet the first graphics screen is almost ready to be revealed.

So clearing space is reserved, and arrays DIMENSIONED before getting the Dragon to learn its letters. Then at line 510 PENDING can be prepared, with no matching SCREEN command yet, 580 sets the initial position variables, plus R to take account of the Dragon's predilection for writing in radians. The 610 to 640 take us into action.

Characters, even 'illegal' ones, are displayed quite quickly on the graphics screen as a command is built up by successive uses of MOVING. To keep programming life simple, this version insists that with all numbers commands there must be a space after the command, before the number; and only whole numbers are recognised. Backspace delete is allowable, as is shift-backspace for deletion of a whole entry. Completion is signalled with (CHR\$(13)) — 'ENTER' — in line 630.

A certain amount of jiggery-pokery with the 'color' set helps to simplify the PSETTING and PPRINTING of the graphics features, as in the clearing of the workspace and disappearance of the turtle in lines 930 to 990.

Next, in analysing the instruction, the first thing is to discover whether it is a single-word instruction (such as 'PENDOWN') or a numerical expression ('F 60, say). The distinction is made by looking for the mandatory space; the procedure also enables the part which is to be VALUED to be separated out by line 1090.

Then the command is compared with the array of acceptable instructions (DATA of line 100) at the top of lines 1100 to 1160. If the instruction is unrecognised a fall through the loop and, in common with many other 'illegal' commands, causes a 'REDC' signal (line 1040) to be displayed for a few

seconds before inviting a fresh attempt.

At last, three-quarters of the way through the program, comes the easy bit — doing the turtle graphics!

Forward and Back are identical apart from direction; line 1150 decides on that detail. Similarly, Left and Right differ only by the sign in lines 1200 and 1260.

But PC errors would abound if precautions were not taken to avoid trying to draw on the plastic surround of the TV screen. So lines 1180 to 1420 issue 'REDC' instructions rather than attempt any such thing.

Whether the turtle should be visible or not is remembered by the simple index M, one or zero. But there are three mutually exclusive alternatives as regards records of movement: none at all is PENUP with index J set 1 whereas PENDOWN is the default 0 and the obliterating RUBBER has J 3.

So there are few problems in producing the lines and circles. Many a computer could do as well. But how can the turtle be moved on without leaving a gap in the drawn lines where they coincided with the turtle outline? This is where the Dragon's PUT and GET come into their own, allowing the turtle to be treated as a separate entity, stored in a memory array. So it can be put 'on top' of the geometry or antitidy being worked on, and removed without leaving any scars.

Just a couple of points of clarification to conclude. You do have to command PENDOWN again after use of RUBBER. And the difference between CLEAR and START is simply that START returns the turtle to the initial position whereas CLEAR leaves it wherever you left it.

So have fun! If anyone accuses you of wasting time you can always explain that you are peering up on the principles of trigonometry by fitting circles into or round irregular triangles and what-not.

Figure 1

```
10 REM MINILOGO
20 CLS
30 PRINT #36,"A SMALL VERSION OF logo"
40 PRINT "*****": PRINT
50 PRINT "REMEMBER logo COMMANDS:": PRINT
60 PRINT " FORWARD OR BACK (L A DISTANCE)"
70 PRINT " LEFT OR RIGHT (L AN ANGLE)"
80 PRINT " circle (L A RADIUS)"
90 PRINT " penup OR pendown OR rubber"
100 PRINT " hide OR show THE TURTLE"
110 PRINT " clear THE LINES OR start AGAIN"
120 PRINT: PRINT "THE AREA IS 256 UNITS BY 192."
130 REM >>>>>>>>>>>> Initialisation
140 CLEAR 1000
150 DIM M$(12),H$(16),L$(29),N$(9),S$(20,26)
160 DATA F,B,R,L,PENUP,PENDOWN,RUBBER,HIDE,SHOW,CIRCLE,CLEAR,START
170 FOR L=1 TO 12: READ M$(L): NEXT L
```

```

180 REM >> Character graphics
190 L4(1)="BR1U8R2P20W5D3"
200 L4(2)="BR1U6R4P08L3FDGL3"
210 L4(3)="BR6LAH04RR4"
220 L4(4)="BR1U6R4P2D202L4"
230 L4(5)="BR1U6R6D0J8L2L4D3R6"
240 L4(6)="BR1U6R6D0J8L2L4"
250 L4(7)="BR04R4P2D2NL2D2GL4R"
260 L4(8)="BR1U6R6D6U3L6"
270 L4(9)="BR2R8L2U6L2R4"
280 L4(10)="BRFR3EJ5"
290 L4(11)="BR1U6R8R4G4EP3"
300 L4(12)="BR1R0R6R5"
310 L4(13)="BR1U6P3EJ06"
320 L4(14)="BR1U6P6U6"
330 L4(15)="BR2R4R4D4GL4R"
340 L4(16)="BR1U6R4PDGL4"
350 L4(17)="BR6LAH04R4P04G0UHF3"
360 L4(18)="BR1U6R4PDGL4R2F3"
370 L4(19)="BRFP3BUHL3HUR3P"
380 L4(20)="BR4U6L3R6"
390 L4(21)="BR1R0U6D5PRAED5"
400 L4(22)="BR1R0U6D1P3EJ03"
410 L4(23)="R06D4P2E2H04P2E204"
420 L4(24)="BR1R6BL6P6"
430 L4(25)="BR0U3E3BL6F3"
440 L4(26)="BR7L4BL6L6"
450 L4(27)="BR5L2U6R3"
460 L4(28)="BR3R2U6L2"
470 N4(1)="BR4U60"
480 N4(2)="BR6L4U2ER2BUHL20"
490 N4(3)="BR2R3EUHML3EUHL3"
500 N4(4)="BR0U6G4R5"
510 N4(5)="BR1P2ED2HL3U2R4"
520 N4(6)="BR2R2PDGL2BU4R2"
530 N4(7)="BR3U3L3L4"
540 N4(8)="BR2R6R2HUR2PDGFDGL2R5"
550 N4(9)="BR3R2U6L2GDPR2"
560 N4(0)="BR2BU6R2R04P2R2U4"
570 PMODE 4,1: FCLE
580 R=120: S=91: A=0: R=57.2957T951
590 LINE(0,185)-(255,191),PSET,BP
400 GOSUB 460
410 PRINT @80,"PRESS ANY KEY TO START....";
420 IF INKEY$="" THEN 620
430 SCREEN 1,1
440 GOTO 760
450 REM >>>>>>>> Turtle-draw subroutine
460 IF R=1 THEN RETURN ELSE COLOR 5,0
470 R0=R+8*SIN(A): R3=R-8*COS(A)
480 L0=R-4*COS(A): L3=R-4*SIN(A)
490 R0=R+8*COS(A): R3=R+8*SIN(A)
500 LINE(R0,R3)-(L0,L3),PSET
510 LINE-(R0,R3),PSET
520 LINE-(R0,R3),PSET
530 CIRCLE(R0,R3),2
540 RETURN
550 REM >>>>>>>> Compile an instruction
560 DRAW "M03,186;D08R2P2ED2D"
570 C=0: D4=""
580 LINE(9+C*9,185)-(18+C*9,191),PSET,BP
590 C4=INKEY$: IF C4="" THEN 790
600 D=ASC(C4)
610 E4="BM"+STR$(9+C*9)+"",191,C2"
620 IF D=21 THEN LINE(9,185)-(18+C*9,191),PSET,BP: GOTO 770
630 IF D=13 THEN GOTO 930
640 COLOR 5,0: LINE(9+C*9,185)-(18+C*9,191),PSET,BP: COLOR 0,5
650 IF D=8 AND C>0 THEN C=C-1
660 IF D=8 THEN D4=LEFT$(D4,C): GOTO 780
670 IF D=32 THEN G10
680 IF D=47 AND D<58 THEN DRAW E4+N4(D-48): GOTO 910
690 IF D=64 AND D<94 THEN DRAW E4+L4(D-64): GOTO 910
700 GOTO 780
710 D4=D4+C4: C=C+1
720 GOTO 780
730 LINE(0,185)-(255,191),PSET,BP
740 IF R=1 THEN 1000 ELSE COLOR 0,5
750 LINE(R0,R3)-(L0,L3),PSET
760 LINE-(R0,R3),PSET
770 LINE-(R0,R3),PSET
780 CIRCLE(R0,R3),2
790 PUT(10,3-10)-((R+10,S+10),S,PSET
1000 REM >>>>>>>> Analyse an instruction

```

```

1010 DA$="": P=0: Q=0
1020 P=INSTR(1,DA$," ")
1030 IF P<>1 THEN 1090
1040 DRAW "BR210,191:GO"+L$(18)+"BR2"+L$(5)+"BR2"+L$(4)+"BR8"+L$(15)
1050 FOR L=1 TO 900: NEXT L
1060 COLOR 5,0: LINE(210,185)-(255,191),PSET,BF
1070 GOSUB 660
1080 GOTO 760
1090 IF P=0 THEN DA$=DA$ ELSE DA$=LEFT$(DA$,P-1): Q=VAL(RIGHT$(DA$,LEN(DA$)-L
EN(DA$)-1))
1100 FOR L=1 TO 12
1110 IF DA$=BB(L) THEN ON L GOTO 1150,1150,1260,1280,1300,1320,1340,1360,
1380,1400,1480,1540
1120 NEXT L
1130 GOTO 1040
1140 REM >>>>>>>> Forward and Back
1150 IF L=2 THEN G=-G
1160 EE=INT(E+0*SIN(A)+.5)
1170 SS=INT(S-0*COS(A)+.5)
1180 IF EE<10 OR EE>245 OR SS<10 OR SS>173 THEN 1040
1190 IF J=0 THEN LINE(E,S)-(EE,SS),PSET
1200 IF J=2 THEN LINE(E,S)-(EE,SS),PSET
1210 E=EE: S=SS
1220 GET(E-10,S-10)-(E+10,S+10),S,G
1230 GOSUB 660
1240 GOTO 760
1250 REM >>>>>>>> Right
1260 A=A+0/R: GOTO 1220
1270 REM >>>>>>>> Left
1280 A=A-0/R: GOTO 1220
1290 REM >>>>>>>> PENUP
1300 J=1: GOTO 1220
1310 REM >>>>>>>> PENDOWN
1320 J=0: GOTO 1220
1330 REM >>>>>>>> RUBBER
1340 J=2: GOTO 1220
1350 REM >>>>>>>> HIDE the turtle
1360 M=1: GOTO 760
1370 REM >>>>>>>> SHOW the turtle
1380 M=0: GOTO 1220
1390 REM >>>>>>>> CIRCLE
1400 IF Q=0 THEN 1040
1410 EE=0*SIN(A): SS=0*COS(A)
1420 IF E+0*EE<0 OR E+0*EE>255 OR S-0*SS<0 OR S-0*SS>183 THEN 1040
1430 PMODE 4,1
1440 IF J=2 THEN COLOR 0,5
1450 CIRCLE(E+0*EE,S-0*SS),Q
1460 COLOR 5,0
1470 GOTO 1220
1480 REM >>>>>>>> CLEAR the lines
1490 PCLS0
1500 GET(E-10,S-18)-(E+10,S+18),S,G
1510 LINE(0,184)-(255,191),PSET,BF
1520 GOSUB 660
1530 GOTO 760
1540 REM >>>>>>>> START again
1550 E=128: S=91: A=0: GOTO 1490
1560 REM MIKE MOSKIN.

```


Expert's Arcade Arena

[illegible]

Well, how about that for a wacky beginning eh? I don't think any of you expected me to start like that did you? You did? Okay then you cozy up some. I'm going to start again. So there! Right, pretend you haven't read this bit. Ready. Three, two, one.

Ha, even better huh? So to business. A letter from someone who signs off "Games All-around! Before I get down to his letter, I'd like to say something, and that is I'm not prepared to receive letters from people writing under clever clever pen names. I'm the pretentious one here. Not you. Not I? Good.

(S). Mr. James Griffin, thanks for your note, and hope's hope her Police for all of my mistakes.

BEANSTALKER: Code is REGISTER.
FLYING MONK: FORD 2110, 125 for infinite.
Guns.

ESCAPE: Code is "7041" but Policy 12401.03 allows anything.

GRAM RICH Cakes with PESET buttons,
New PHONE 770-619-0800/PHONE 770-4013 for
infinite love. FINE 7003

DAVING OF CHADS: Type FFOLET on the page. E moves on to the next screen.

DEATH MOVES OF SARUS: Codes are OBLU and TLL (Can anyone help me with the adventure game. — *The Expert*.)

the Games/Potentialist Name-givers to present the long-awaited program "C" which breaks into day-one Microdeal, Tom Mix, or Rocket Mouse games.

```

PROGRAM C
10 PCLAMP=CLAMP 10 FOR 1-1000
1001 READM FOR M=NEXTENDC(1000)
50 ENDC PEEK (1040+250) = PEEK (1040)
40 DATA 124,126,103,1,102,48,103,28,101,1,
103,101,21,103,28,104,3,101,10,102,84,101,
5 103,28,207,100,64,10,100,5,126,100,50,
100,10,103,1,101,2,83,104,102,60,100,105,
100,100,51

```

Simply put a `POKE` on line 20 or turn line 20 from `EXEC` to `PRINT` and the Program will print on the `EXEC` address.

This should help with the PC0055 from earlier columns, and here's a few more that will work with it, all of which give infinite lines:

PENNSA PORE TROJOS
JET BACK GOLD PORE SPULT-PORE
BORG IT

TEA TIME: POKE (1994, 108-
SHOCK TROOPER repeated by popular
demand); BOKE (1994, 108)

For those interested, the Games Allocated is really Paul C. Burger, who promises to reply to all those who write to him at the following address, as long as they send him an SASE. His e-mail is burger@netcom.com. Can you

Write in 'The Expert' at Dragon User
c/o Little Newspaper Co., London WC2H 7PP,
with all your words, time and mine.

Address: 10000 Wilshire Blvd., Suite 1000, Beverly Hills, CA 90210

Paul G. Bergin, 18 Mooncroft Road,
Burlington, Northfield, Minnesota 55440

Finally, Paul has won an award. The award goes to Paul for "Most Creatively 'I Want To Kill An Award' Type Letter Ever Sent To An Arcade Column In A Publication Called *Dragon* Mail." Congratulations, Paul!

Now, to Robert Cassman's letter:
 May I be so bold as to register a complaint (plain old one you can't — The Expert). It is concerning Shalee Master by QuickBooks (Ilost job too — The Expert). What I find very annoying is the poor detecting when fighting. For example, the opponent may attempt to hit you even if you are some way off. This also happens with the ring sensors and the high kick. Could you use your influence at QuickBooks and let them know of my complaint? (His words, not mine)

"Well, your complaint is now in print and knowing Dave at Quickbeam, he'll make a lot of notice of your complaint (cause they're very keen to please) and I should think something will get done about it. I'll keep you posted."

The Total Eclipse savegame editor WILL work on the DPMON 32 now. Just type Clear 00020419 before running. Many thanks to Pam DOAcy for saving the day. See you next month.

FIRE FORCE

COMING SOON

PRINTER CONTROL

Also, *Microchem. J.* 1990, 44, 1-10.

What do customers say?

"A joy to use!"

"At the price, it's a gift!"

"Why can't all utilities be this easy to operate?"

Five

High speed — adaptable machine code program to print and modify any or all of your 80-line screen. Accessible from your [F10] program — full instructions and examples supplied. (Operates with or without DOS — see notes.)

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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DEAL VALUE FOR MONEY SAVING



I'LL BEGIN with a long letter from regular reader Matthew Lodge, full of plots, clues and news, probably enough to fill the whole column by itself — maybe this is a take-over bid? Get out, Lodge! Clues include how to get the elusive emerald in Juxtaposition, for which you must have the sender unit and the transmit receiver, then from outside the door where the emerald is you. **REDNES (S)UNSHADE TEGW/ QWETECR PORD**, Matthew's wondering where to get a videotape; **AREMAC EHT EBU**. (And watch for a full solution to this game next month.) On the same game, Matthew comes up with some possible sources for Ceti VI, firstly in Robert Heinlein's book *Satanstoe*, where a Ceti VI is mentioned as a planet, and in *Star Trek* II where there was a Ceti Alpha VI planet with unbearable atmosphere.

Watery entrance

In *Wizard of Azkoy* Matthew suggests you try lighting in the dark when in the cave, and you should trust the fox and be prepared to follow him. In *Sarcovor of Claymorgue Castle*, don't use the Sesame Seed spell to get you inside the castle — go for *treacher's entrance* instead, you'll need Sesame later. To get your first star: **SEENT TA ERIF TSAC**.

This busy reader has also been writing his own G4X21 screen driver and integrated it into Dragoon BASIC, and tells me that there's a chance that Roy Cooper's Marowise will be using it in an adventure. They're thinking of releasing. Finally Matthew has finished lots of adventures, from *Mysterious Adventures* to *Scott Adams*, and would like to swap them for new challenges if anyone's interested. Write to: Matthew Lodge, 'Maen Meiri', Holmes Chapel Road, Lich, Denia, Northwich, Cheshire CW9 7SZ. And remember to spell his first name with only one 'l' as he doesn't half get cross if you get it wrong!

Also on the look-out for adventures is Greg Southenden, 21 Courfield Avenue, Lordswood, Kent ME5 8QR, and specifically for the graphics version of *Callisto Island* and *Alloch Sarcovor*, which he's having difficulty tracking down. If you've solved them and want to sell them, contact Greg, who claims to be the worst adventure player in the world, which is why he has no finished adventures of his own to swap in return: he's currently stuck in about

30 different ones, he reckons!

A rocket from reader Ian Rockett, not aimed at me but at a French reader, Daniel Merlot, who has sent 18 programs in a swap they'd arranged, but the return programs never arrived and nor have replies to Ian's several letters asking what's going on. So a warning there for everyone, Ian's letter goes on to list a routine that will let you inspect the data statements in many BASIC adventures, enabling you to look at verbs, nouns, responses and anything else held as data. Type the routine as one complete line, but without a line number: **POR A = 1 TO 23456: CL: POR B = 1 to 15: READ RS: PRINT RS: NEXT EXEC 41594: NEXT B** The 'B' loop makes the routine print out just 15 blocks at a time, so presumably key to get the next block of 15. If you want it to run in edit mode, change the EXEC to EXEC 57570. Anyone interested in routines like this and in programming generally can contact Ian at 2 Knowle Road, Surley, Leeds LS4 2PJ.

Bob Bernasconi of 16 Woodland View, Lurville, Bodmin, Cornwall, is stuck in various places and would like to hear from anyone offering help on *Caverns of Doom* (how to get the maushrooms and avoid starvation), *Wizard of Azkoy* (how to get through the hen-house (kiddo)), *Arrow of Death II* (how to get anywhere!) and *Operation Saker* (any help on Part Two).

Also suffering in *Saker* is Mark Brocklehurst of 1 Park Avenue, Mansfield, Leics, LE6 0BA, who wants to know the code that is asked for after answering Rhythm's questions, which he'll now know if he's read the last couple of columns. Mark offers help on *Castle Adventure*, *Ring of Darkness*, *Mystery of the Java Star* and *El Diablos*, and also asks if anyone out there wants an adventure game break as a pen-friend. He doesn't say quite how freakish he is, but he seems quite normal from his letter. Mind yes, how normal is an adventure player anyway?

Ray Thomas lives in a place called Solva, a good home for an adventurer, and what's more he's just solved *El Diablos*. Having breathed a sigh of relief for that, he's straight into *Wings of War*, where he asks what to do when confronted by the Kommandant, how to get a pass to get past the Luger-toting guard, and how to open the toolbox. The second is solved by the first, which requires a simple: **TRANSCID**

QWYTRN, NEHW UEH YAS. Can anyone help on the toolbox? Write to Raymond at 48 Bra Canal, Solva, Haverfordwest, Dyfed SA62 0TZ.

David Bird of Newport wants to know how to get into the castle in *Castle Adventure* — not that this has stopped him playing the game as he's fiddled with the program so he can begin the adventure inside the castle, but he wants to do it legitimately. As far as I remember, David, that's a simple matter of getting the right command, either **GO DOOR** or **GO CASTLE**, but if that doesn't work contact Mark 'Freak' Brocklehurst from two paragraphs ago.

Help needed on *Grove*, *Arrow of Death II*, *An Little Indians* and *Perseus and Andromeda* for Neil Huggins, 6 Monmouth Court, Henthedowns, Caerphilly, Mid Glamorgan CF8 2TG, and help offered in return on *Knobber*, *Time Machine* and *Juxtaposition*. And with Neil's letter I've just noticed something that could be incredibly significant. These last three letters are the only ones this month without stamped addressed envelopes enclosed, which is why they're dealt with in the column rather than with personal replies. The significance? All three of them come from Wales! So it's not true what they say about the Scots being lightfingered, it's the Welsh all along! (Kindly address letters of complaint to the Place Holdings Board.)

Closed Gates

Colin in Cornu is also from Wales, so those hillside must really be ringing with the sound of keyboard banging and frustrated adventures. Colin's stuck in *Jerusalem Adventure*, being unable to open the Golden Gate, so keys or clues please to 153 Boreland, Greenmeadow, Cwmbran. Gwent NP44 4LG. He should contact A.D. Gore of 43 The Downs, Harlow, Essex CM20 3RE, who's solved *Jerusalem* as well as *El Diablos* and *Franklin's Bomb*. He (or she) is completely baffled on *Lost in Space* and *Pinky Business*, but so am I, so... meen, wouldn't you just know it, someone writes in to ask about adventures I can actually answer problems on, and they forget to tell me what the problems are!

Poul Cooper asks how to get back once transported on *Syrryng*, and how to enter the command to get down the dark pit on the upper floor. He's been

told to hold the blanket and the string, but **HOLD STRING, HOLD BLANKET** and **HOLD BLANKET AND STRING** don't work. So what will Paul be perplexed at 192 Redhouse Road, Melbourne, Derbyshire DE7 1SC.

Anyone perplexed by Dragon Mountain should contact Steve Driver, 93 Valley View, Lexington, Fife, Scotland UP10 5BG, as Steve has solved that one, but needs help on The Air Trilogy and Juxtaposition. See next month's column for clues, gales, Steve.

There's been a lack of help so far this time, but let me finish with some more info on Madness and the Mincrow from Steve Barritt, who provided some details about the spells that I gave in an earlier column. Steve says he's happy to try to answer specific questions on the adventure, if anyone wants to ring him on 0837 706670, and he's there most evenings from about eight to ten o'clock. The following details on Madness aren't going to be printed backwards, there are too many of them for that, but as so many people are stuck all over the place in this one I hope no-one will mind.

1st Floor: all items dropped in the mushroom will remain safe & unneeded, but dropped elsewhere they may be relocated by the spirits. There is always one spell room on this floor, to which you must take the mushroom and the food. To discover the items needed to get the spellbook, **LOOK POOL**. The

Jewel box, tablet, scabbard and scroll are pseudo-treasures as they are found in the same locations as normal treasures but they don't score points, though some do have other uses. You can refill bottle with water from any pool on this floor, and drinking water adds 32 points to your condition. Eating food adds 30 points, and as you eat more food is relocated on floors one and two only.

Second Floor: at the start of each game this contains the sun, fate and skull, and also has three rooms to get these spells you'll need the parchment, talisman and rope from the fourth floor.

Third Floor: this always has the axe, mace, basket, mushroom and pen-

dant, and is the most difficult level to map, being split into two different areas. Use the **BACK** command frequently as there are many one-way movements possible.

4th Floor: always contains at start of each game the parchment, talisman, rope, sceptre, goblet, glowing rocks, music room and a second pit. In the music room you'll need the flute, rope and parchment to play the flute and climb the ledge. For the glowing rocks use **CHISEL**. The **LOOK PIT** command works at random times, so keep trying.

I also tend to work at random times, but with any luck the next time will be next month.

Adventure Contact

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problems and your name and address, and send it to Dragon User Adventure Helpline, 12/13 Little Newport Street, London WC2H 7PP. As soon as enough responses have arrived, we will start printing them in the magazine.

Don't worry — you'll still have Adventure Trail to write to as well!

Name
Address
Problem
Name
Address

Adventure Contact

Adventure: 1) Wings of War 2) Syzygy 3) Calisto Island **Problem:** How to get past the guard? 2) Where to find the huge Ugly Alien? 3) Where to get the can? **Name:** Alastair Scanlan **Address:** 10 Lynton Road, Hush End, Pinner, Middlesex HA8 8PH. Tel. 01-426 1713. **Adventure:** Pterodactyl Tomb **Problem:** I am stuck and I cannot find the wire collar or get out of the pit. **Name:** Jonathan Miller **Address:** 130 North Dry Road, Sidcup, Kent DA14 5HL.

Adventure: Syzygy **Problem:** Fighting radar and using the transporter **Name:** A. Storen **Address:** 30 Cannon Park Road, Coventry CV4 1AV.

Adventure: Juxtaposition **Problem:** How do I get the emerald and the diamond belt? **Name:** Gary Coaling **Address:** 379 Redline Lane, 3rd St Madison, Cheshire, E506.

Adventure: Syzygy **Problem:** What do you do when you get to the computer. How do you get to the planet and back up? Where is the light sabre, how

do I set the co-ordinates right? **Name:** TPA **Address:** 43 Falmouth Road, Abbeydale, Sheffield S7 2DG.

Adventure: Williamsburg **Adventure:** 3 **Problem:** How do you get over the wall to the second passage without being shot by the police? **Name:** G.H. Morris **Address:** 15 Portcullis Road, Prestwich, Greater Manchester M33 5QG.

Adventure: Juxtaposition **Problem:** How do I survive in the volcanic cave in the yellow sector? Where are the yellow and brown ID cards? **Name:** Fraser J. Chudrum **Address:** 47 Batek Close, Kempton, Beds MK13 9BU.

Adventure: Ring of Darkness and Madness and The Mincrow **Problem:** Need any help I can get, I keep getting killed. **Name:** Andrew Miller **Address:** 8 Linton Close, Birmingham, Cleveland TS23 8PU.

Adventure: El Children **Problem:** Everything I can offer help with Sea Quest and Keys of the Wizard. **Name:** Christina Garcia-Herzog **Address:** c/o Biscan No. 445, 608 28824, Madrid, Spain.

Adventure: The Emperor Must Die **Problem:** What is the code name and the code action game? **Name:** Edward Brown **Address:** The Drive, Barwell, Leicester, LE19 8LA.

Adventure: see question **Problem:** How many levels in Chuckie Egg? How many treasures in Cuthbert in the Jungle, how to get POKE in DU. March 1984 to work for Cuthbert in Space? **Name:** Paul Palmer **Address:** 15 Underhill Road, Maccles, Gloucester GL4 8RL.

Adventure: Juxtaposition **Problem:** How to fit the jewelled inner tube and could someone send a map? **Name:** Alan Stoneman **Address:** 30 Cannon Park Road, Cannon Park, Coventry CV4 3W.

Adventure: Syzygy — Mission of Doom **Problem:** Everything can't get very far please help. **Name:** Neil Kendall **Address:** Redoubt, Starnpond, Truro, Cornwall.

Adventure: Madness and The Mincrow **Problem:** Could I have the help please? **Name:** Steve, Fleet, Hants GU13 4SB. **Adventure:** Juxtaposition

Name: Nicholas Payne **Address:** 47 Reading Road **Problem:** How do I get the white key card from the old caretaker? Where is the mass? **Name:** Wayne Robstad **Address:** Starlauga No 35, 8530 Minnesota, Norway.

Adventure: Juxtaposition **Problem:** How to get the diamond Emerald off the pedestal without getting gassed? **Name:** Dominic Leary **Address:** 27, Fishers Lane, Penrith, Winst. Merseyside L21 8W.

Adventure: The MET Trilogy — Temple of Vorn **Problem:** How to do with the Alien that is gangling brain? How to get over the last river? **Name:** David Haddock **Address:** 28 Meadow Avenue, Preshel, Blackpool FY8 6HA.

Adventure: Trekbox **Problem:** How do you get onto the planet? Is there a target needed to stay alive on the planet? How do you get past the planet and everything after? **Name:** Ryan Henderson **Address:** 2 East Clappfield, Edinburgh, Scotland EH8 6TU.

Prime Examples

Gordon Lee sends a Dragon to catch a wild goose or two.

LAST MONTH on this page, we printed a number of short puzzles which might amuse the reader. The solution to question 1 was given last month. Here are the solutions to numbers 2, 3, and 4.

2. For this problem we were required to rearrange the nine digits (1 to 9) to form the lowest possible, and highest possible, primes. Now, a prime number is one which does not have any whole-number factors apart from itself and one. Unfortunately, there is no easy way of determining if a given number is prime or not, apart from trial divisions. Theoretically, if a given number is divided by all primes smaller than, or equal to, the square root of that number, and an exact division is not found, then that number is prime. Consequently, the testing of nine-digit numbers is not quite a lengthy procedure. Consider to this is the fact that the nine digits can be arranged in over a third of a million different ways, and so the task seems quite formidable.

However, at the beginning of last month's article was a word of caution to the effect that not too much reliance should be placed on using a computer method of solution. A simple mathematical rule states that if the sum of the digits of a number is divisible by 3, then that number is also divisible by 3. Now, the digital sum of the digits 1 to 9 is 45, and, as 45 is divisible by 3, any arrangement of the same digits in any order will always give a number which itself is divisible by 3. Consequently, that number cannot be prime! My apologies to any readers whose 'Dragons' are still ticking over on that one, looking for an answer which does not exist!

3. By contrast, this problem is an excellent example in which the computer is an invaluable tool in its solution. Indeed, there is no way of solving it by conventional mathematics except by 'trial and error'; this is the method that the computer uses, but the computer's ability to perform rapid and repetitious calculations makes it a task ideally suited to this method of approach.



The diagram shows the field, with centre O. It has been bisected by the diameter PQ. For convenience, only half of the field will

be considered, and the radius of the field will be taken as unity. In the diagram:

OS = OP = 1 (the radius of the field)
P is the point of attachment of the rope to the fence, and PR = PS (the length of the rope, L).

In the semi-circle, the area reached by the goat is that bounded by the two arcs PS and RS, and the line PR. This is equal to the area of the sector of the circle centre O and radii OS and OP, plus the area of the sector of the circle centre P and radii PR and PS, minus the area common to both — that is the triangle OSP. With a correct value for L, this should equal one quarter of the area of the field. In the listing given, the length is initially set at a value of 1.5, and this value is constantly amended depending on the result of the calculations. Unfortunately, the mathematics used in this listing are complicated because of having to convert all angular measures to radians, and, because of the lack of an inverse cosine command on the 'Dragon', I wanted to use a circuitous method of calculation using the arctangent command.

```
10 PI=3.14159265
20 L=1.5
30 D=L+L*(PI/2-ATN(L/SQR
  (4-L*L))/2
40 B=ATN(L/SQR(4-L*L))
50 S=(PI+L/2
60 T=SQR(8*(S-1)*(S-1))*
  (PI-L)
70 A=D+B-T
80 PRINT A, PI/4
90 IF ABS(A-PI/4)>1E-5 THEN
  GOTO 30
100 L=(L/A)*(PI/4)
110 GOTO 30
120 PRINT "THE LENGTH OF ROPE
  IS",100*L," FEET"
```

This gives a final value of 119.87285 feet.

Readers who are interested will, no doubt, be able to recognise the various geometrical formulae used in this program. A more detailed account of this 're-derivative' method of solution can be found in the March '88 issue.

4. The solution to this problem, like that of problem 2, is one for which your computer will search in vain! For any square (n), such that $n=n^2$ the following equation also applies:

$$(n-1) = (n-5)(n+5)$$

Thus, one less than a perfect square is always non-prime (except where $n=2$ and so $n-1$ becomes 1). To demonstrate this graphically, lay out 16 coins in a 4 by 4 arrangement. Now remove the bottom right-hand coin. Note how the remaining three coins in the bottom row can now be placed alongside the top three rows to produce a 3 by 3 arrangement. The general principle will apply to any square, however large.

Now for this month's competition. Consider the following series of words, starting, starting, starting, string, string, string, and so on. Each word is formed from the preceding word by simply deleting a single letter at each step. This month, you have to find a similar series, but using numbers instead of letters.

```
----- (a perfect cube)
----- (a prime number)
----- (a multiple of 9)
----- (a prime number)
----- (a perfect square)
----- (a prime number)
```

Note that you are not allowed to have leading zeros in any step, so, for instance, the cube 30080031 could not be converted to the prime 30031. How many solutions can you find?

Prize

After departing a little from our usual custom this month by offering prize winners instead of a name game, Graham Gordon Lee's ever-expanding, and you could win one of 20 vouchers giving you £5 off any program in John Fern Discworld Software's current stock. JFDS's range includes a wide selection of disk utilities as well as old and new games, so the choice is yours.

Rules

When you have solved (you believe!) the puzzle on the page above send us a printout of your program (in cassette) and any explanation you want to include on how you arrived at your conclusion. Please mark the envelope 'SEPTEMBER COMPETITION' and don't forget your name and address.

To give us a fair chance, complete the phrase 'Oh, little flower upon the ground' using your old and skill.

June winners

The winners of Smithson Computing's Gordon Bennett are: Colin Maryon-Smith of Northampton, John Miles of Radstock, G. Hickson of Rochester, P.J. Taylor of Aylesbury, D. Mounie of Rainham, M. French of Goswells, Chris Montague of Gosney, Neil Michaelson of Swinley, Chris Jolly of Grove Park, Hank Bender of Massena, Nigel Davies of Chesham, M. Gassman of Bangor, P.A. Jamieson of Stockton-on-Tees, Ray Woods of Wood, Keith Davis of Cusley, S.P. Greenfield of Ingateside, Robin Spenser of Sale, R. Christian of Thame, and P. Elworthy of Ganges-to-Gosney, who takes us in task for finding his last entry too subtle. No problems this time: 'Bathrooms can be dangerous because... (from ym), (Post), A.H.H. HOOOoo... (sigh)'

Solution

A great many people calculated correctly that the number which only repeats after four operations is 2895.

